OIPE JC99
APR 09 2004
PATENT & TRADEMARK OFFICE

Fig. 1

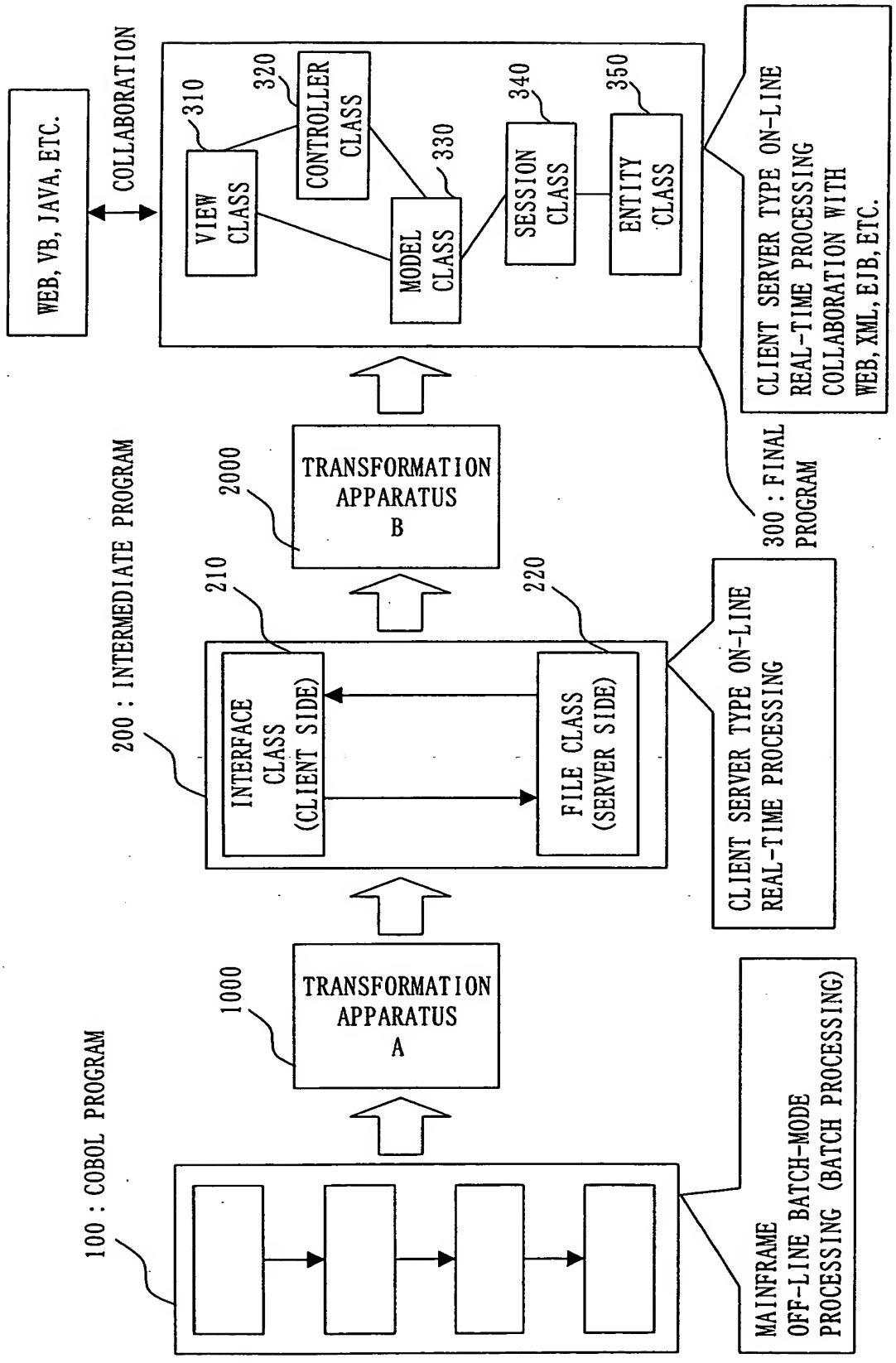


Fig. 2

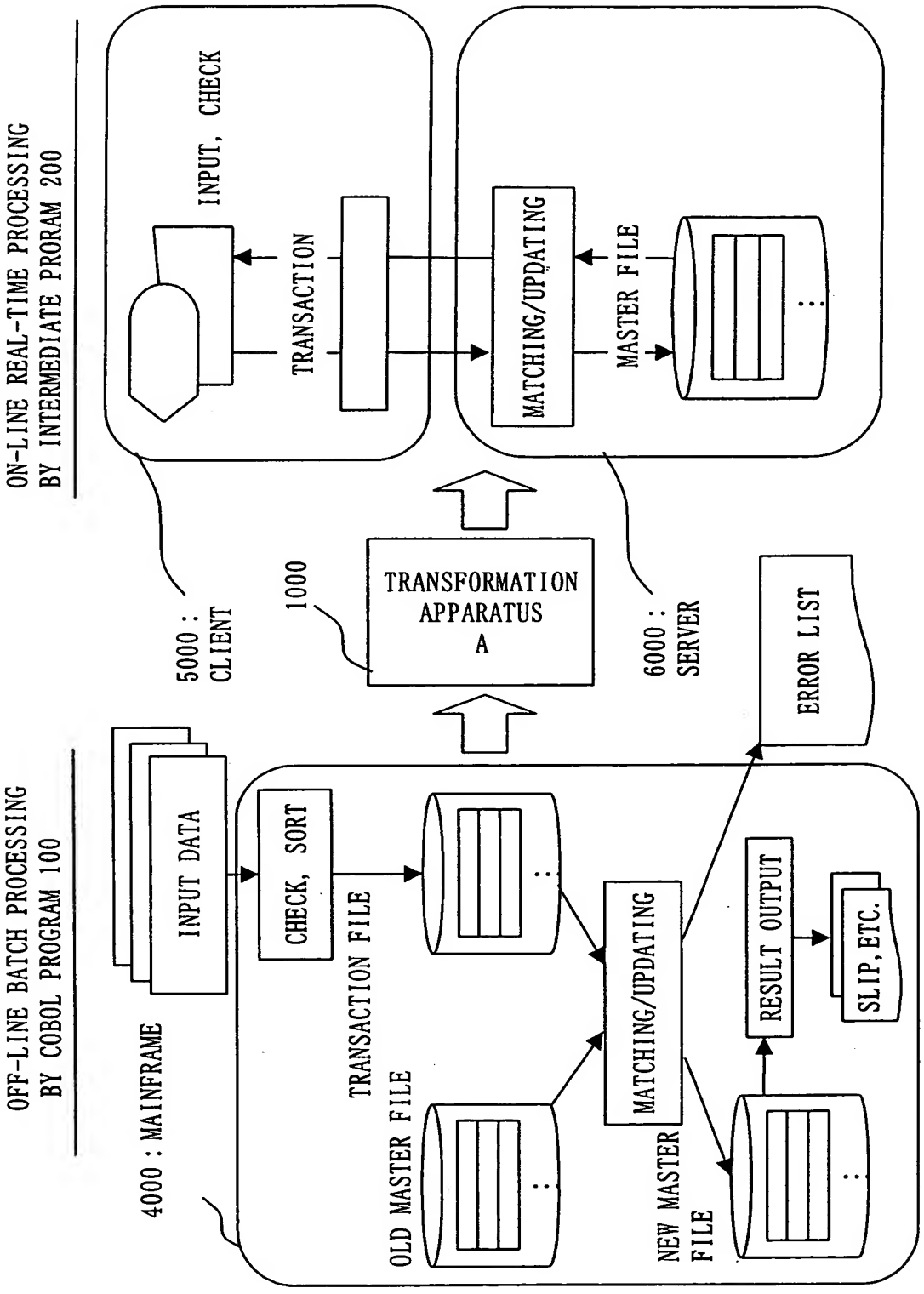

ON-LINE REAL-TIME PROCESSING
BY INTERMEDIATE PRORAM 200
INPUT, CHECK
TRANSACTION
MATCHING/UPDATING
MASTER FILE
5000 :
CLIENT
1000
TRANSFORMATION
APPARATUS
A
6000 :
SERVER
ERROR LIST
OFF-LINE BATCH PROCESSING
BY COBOL PROGRAM 100
INPUT DATA
CHECK, SORT
TRANSACTION FILE
RESULT OUTPUT
SLIP, ETC.
4000 : MAINFRAME
OLD MASTER FILE
MATCHING/UPDATING
NEW MASTER
FILE

Fig. 3

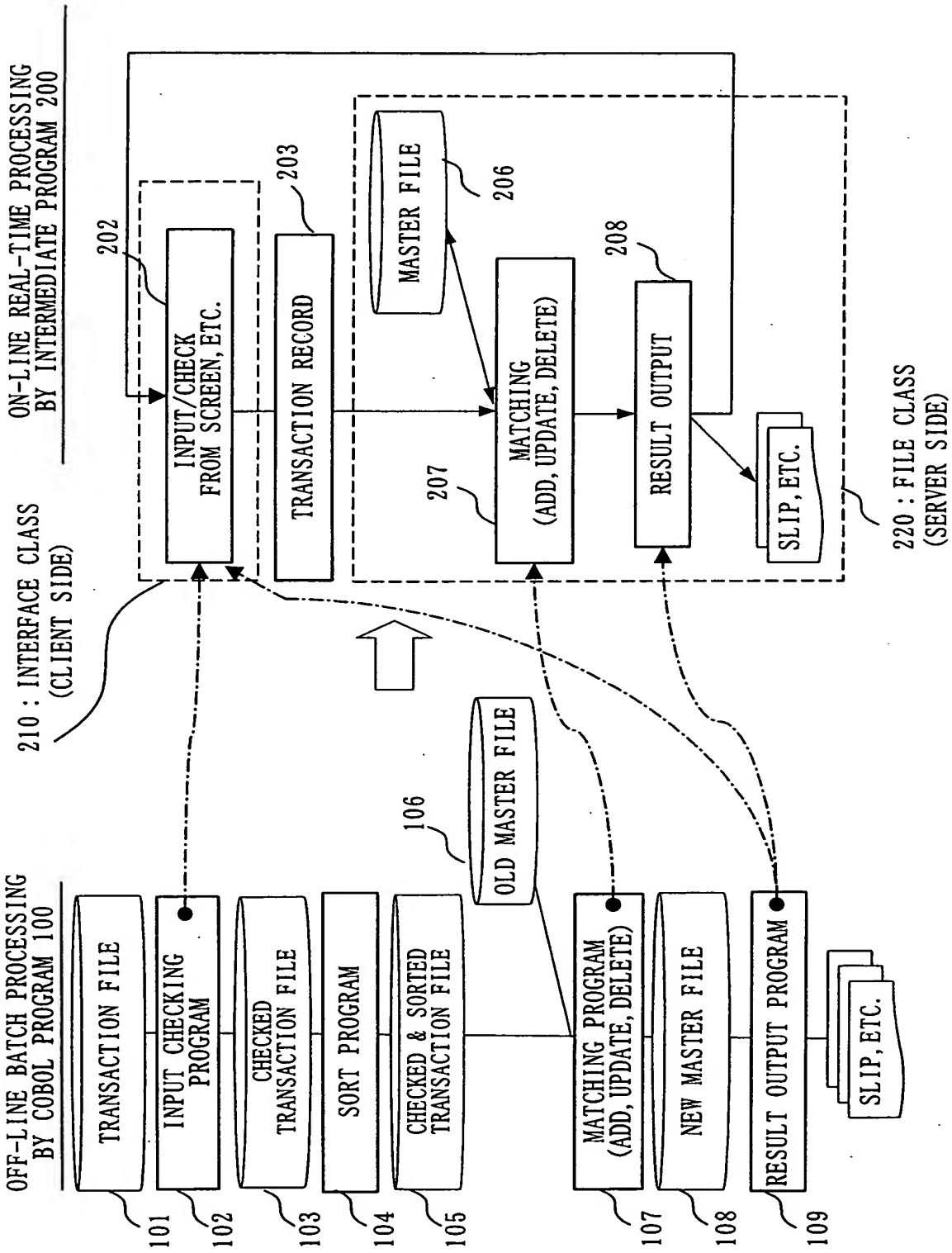

ON-LINE REAL-TIME PROCESSING BY INTERMEDIATE PROGRAM 200
210 : INTERFACE CLASS (CLIENT SIDE)
220 : FILE CLASS (SERVER SIDE)
202
INPUT/CHECK FROM SCREEN, ETC.
203
TRANSACTION RECORD
MASTER FILE
206
207
MATCHING (ADD, UPDATE, DELETE)
208
RESULT OUTPUT
SLIP, ETC.
OFF-LINE BATCH PROCESSING BY COBOL PROGRAM 100
106
OLD MASTER FILE
TRANSACTION FILE
INPUT CHECKING PROGRAM
CHECKED TRANSACTION FILE
SORT PROGRAM
CHECKED & SORTED TRANSACTION FILE
MATCHING PROGRAM (ADD, UPDATE, DELETE)
NEW MASTER FILE
RESULT OUTPUT PROGRAM
SLIP, ETC.
101
102
103
104
105
107
108
109

Fig. 4

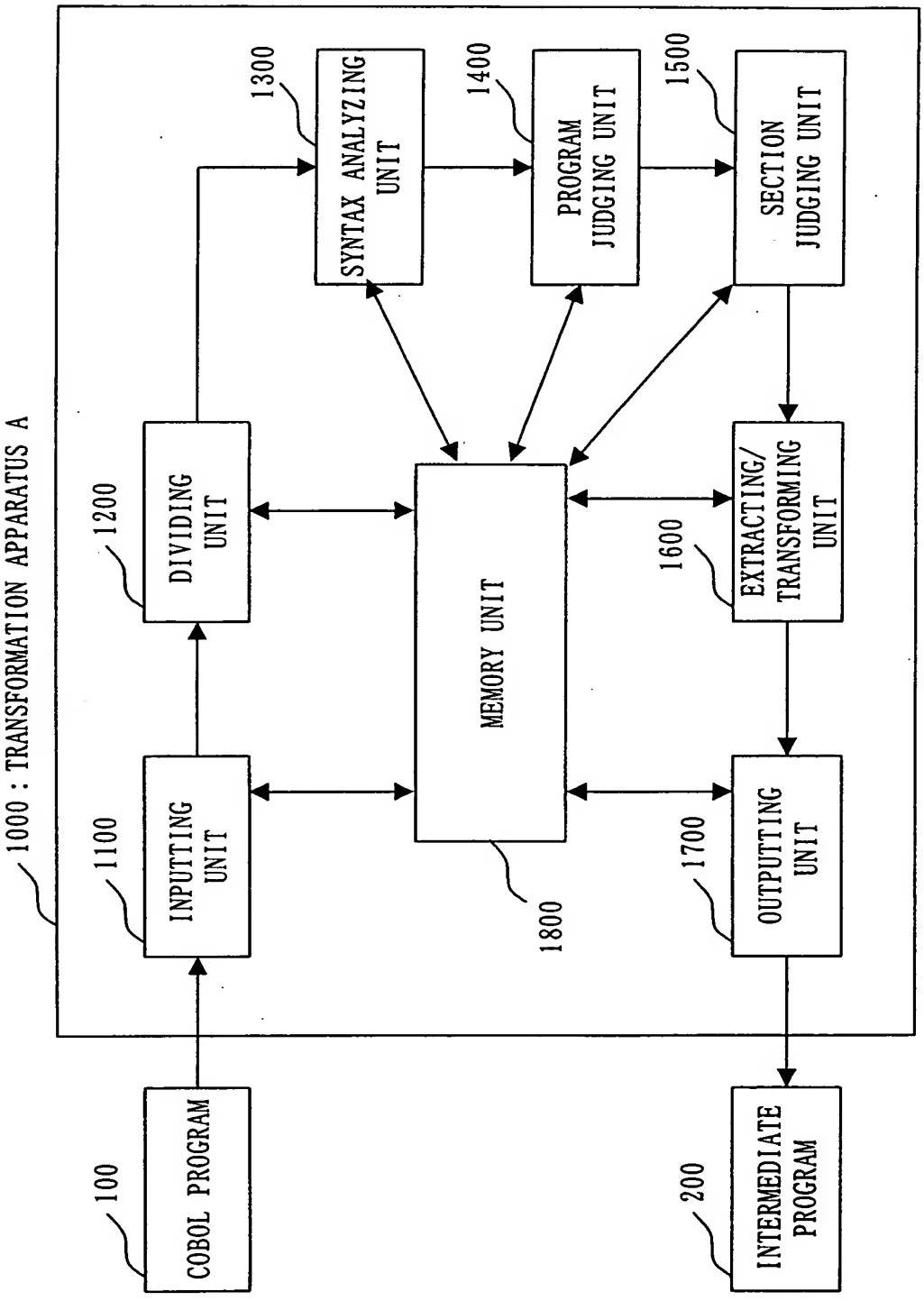

1000 : TRANSFORMATION APPARATUS A
100
COBOL PROGRAM
1100
INPUTTING UNIT
1200
DIVIDING UNIT
1300
SYNTAX ANALYZING UNIT
1400
PROGRAM JUDGING UNIT
1500
SECTION JUDGING UNIT
1600
EXTRACTING/ TRANSFORMING UNIT
1700
OUTPUTTING UNIT
1800
MEMORY UNIT
200
INTERMEDIATE PROGRAM

Fig. 5

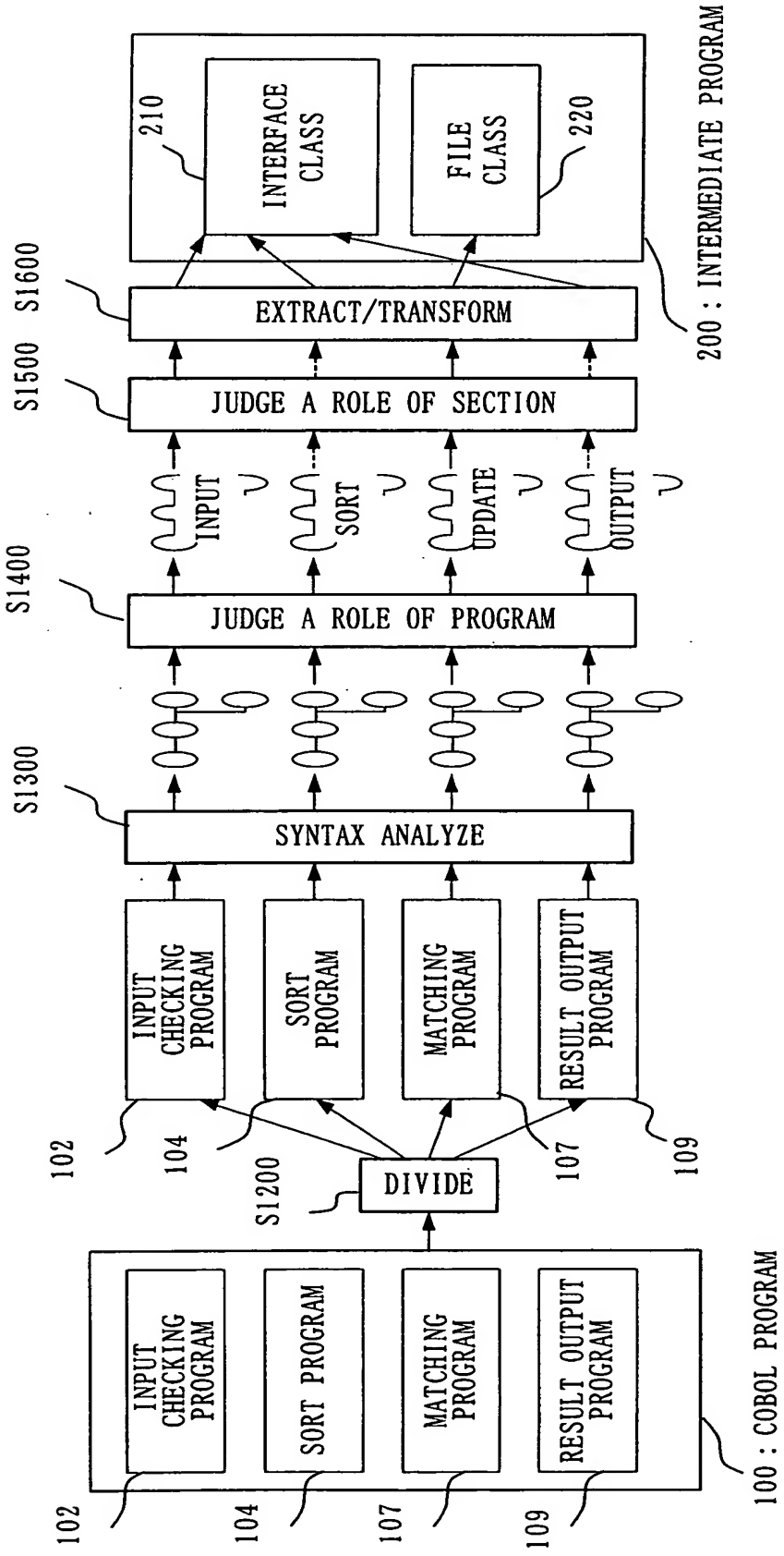

100 : COBOL PROGRAM
200 : INTERMEDIATE PROGRAM
INPUT CHECKING PROGRAM
SORT PROGRAM
MATCHING PROGRAM
RESULT OUTPUT PROGRAM
DIVIDE
SYNTAX ANALYZE
JUDGE A ROLE OF PROGRAM
JUDGE A ROLE OF SECTION
EXTRACT/TRANSFORM
INTERFACE CLASS
FILE CLASS
INPUT
SORT
UPDATE
OUTPUT
S1200
S1300
S1400
S1500
S1600
102
104
107
109
210
220

Fig. 6

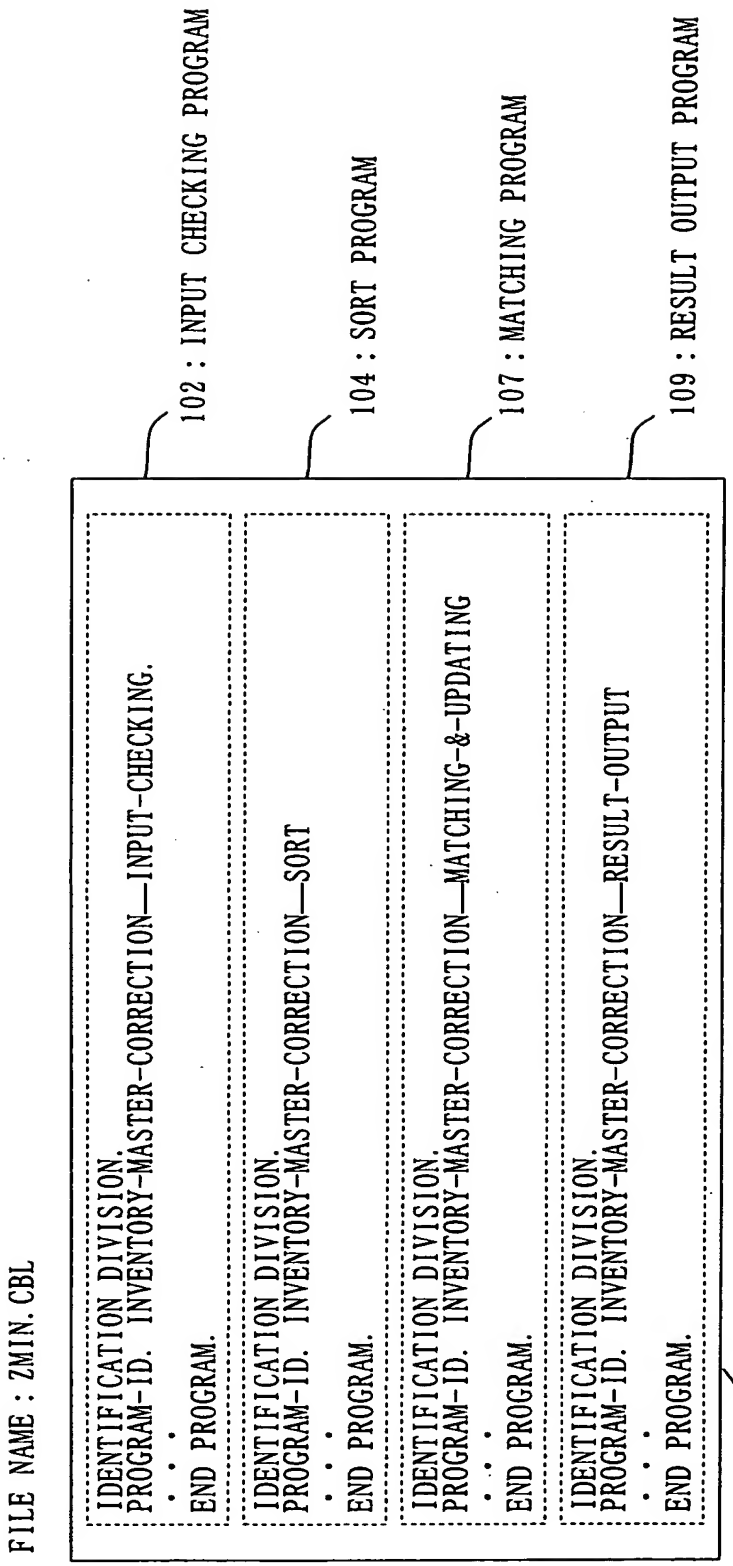

FILE NAME : ZMIN.CBL
IDENTIFICATION DIVISION.
PROGRAM-ID. INVENTORY-MASTER-CORRECTION—INPUT-CHECKING.
. . .
END PROGRAM.
IDENTIFICATION DIVISION.
PROGRAM-ID. INVENTORY-MASTER-CORRECTION—SORT
. . .
END PROGRAM.
IDENTIFICATION DIVISION.
PROGRAM-ID. INVENTORY-MASTER-CORRECTION—MATCHING-&-UPDATING
. . .
END PROGRAM.
IDENTIFICATION DIVISION.
PROGRAM-ID. INVENTORY-MASTER-CORRECTION—RESULT-OUTPUT
. . .
END PROGRAM.
100 : COBOL PROGRAM
102 : INPUT CHECKING PROGRAM
104 : SORT PROGRAM
107 : MATCHING PROGRAM
109 : RESULT OUTPUT PROGRAM

Fig. 7

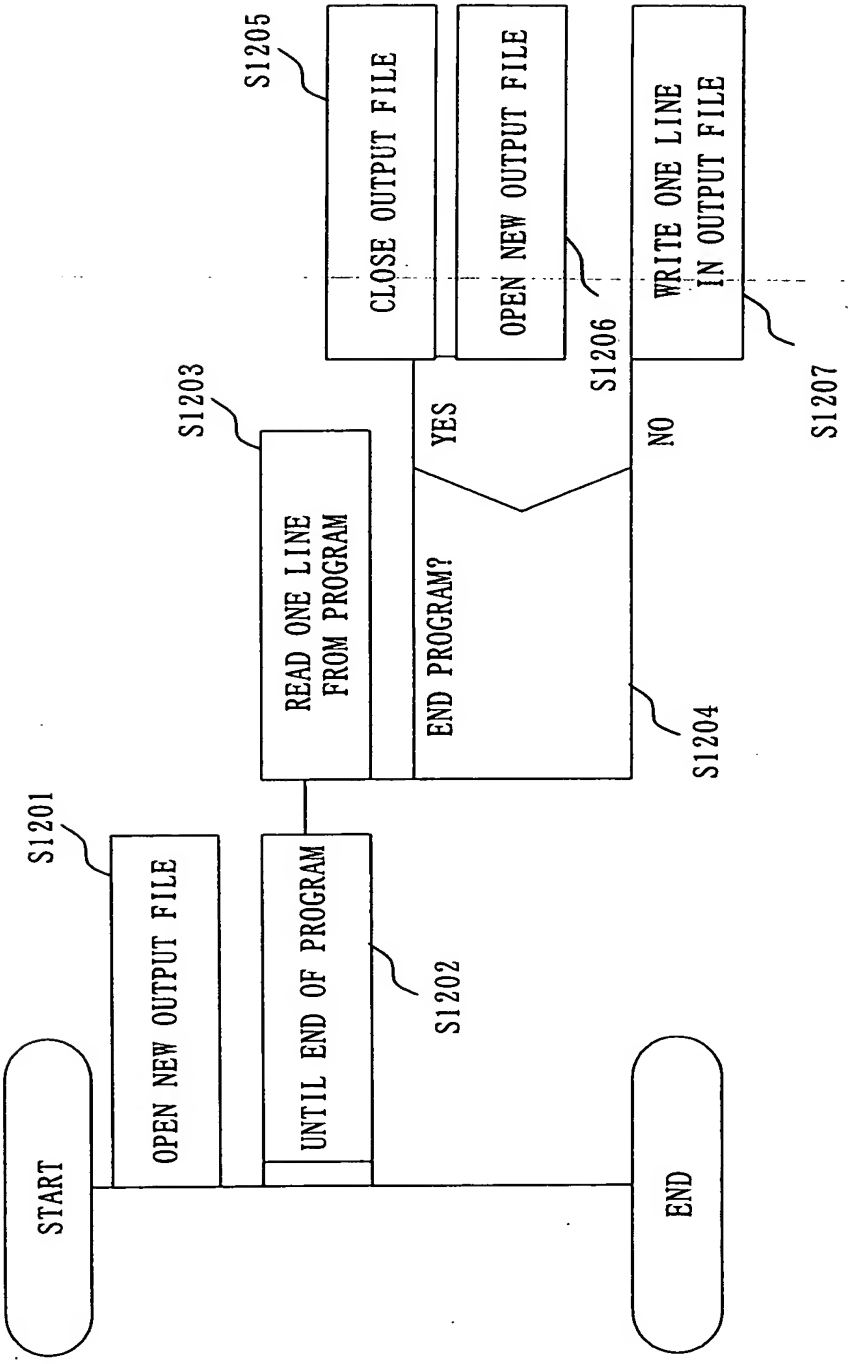

START
S1201
OPEN NEW OUTPUT FILE
S1202
UNTIL END OF PROGRAM
S1203
READ ONE LINE FROM PROGRAM
END PROGRAM?
YES
NO
S1204
S1205
CLOSE OUTPUT FILE
OPEN NEW OUTPUT FILE
S1206
WRITE ONE LINE IN OUTPUT FILE
S1207
END

Fig. 8

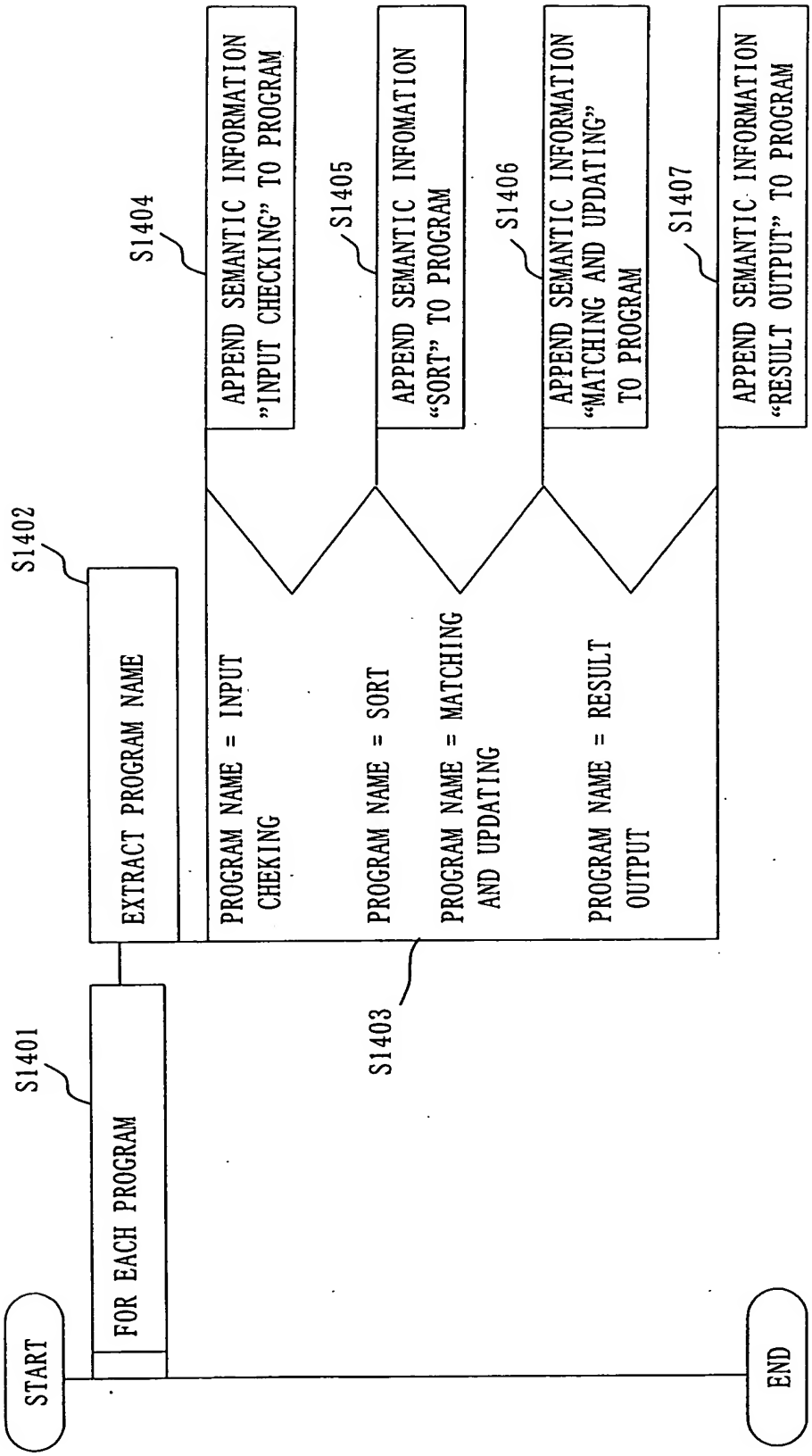

START
FOR EACH PROGRAM
S1401
EXTRACT PROGRAM NAME
S1402
S1403
PROGRAM NAME = INPUT CHEKING
PROGRAM NAME = SORT
PROGRAM NAME = MATCHING AND UPDATING
PROGRAM NAME = RESULT OUTPUT
S1404
APPEND SEMANTIC INFORMATION "INPUT CHECKING" TO PROGRAM
S1405
APPEND SEMANTIC INFOMATION "SORT" TO PROGRAM
S1406
APPEND SEMANTIC INFORMATION "MATCHING AND UPDATING" TO PROGRAM
S1407
APPEND SEMANTIC INFORMATION "RESULT OUTPUT" TO PROGRAM
END

Fig. 9

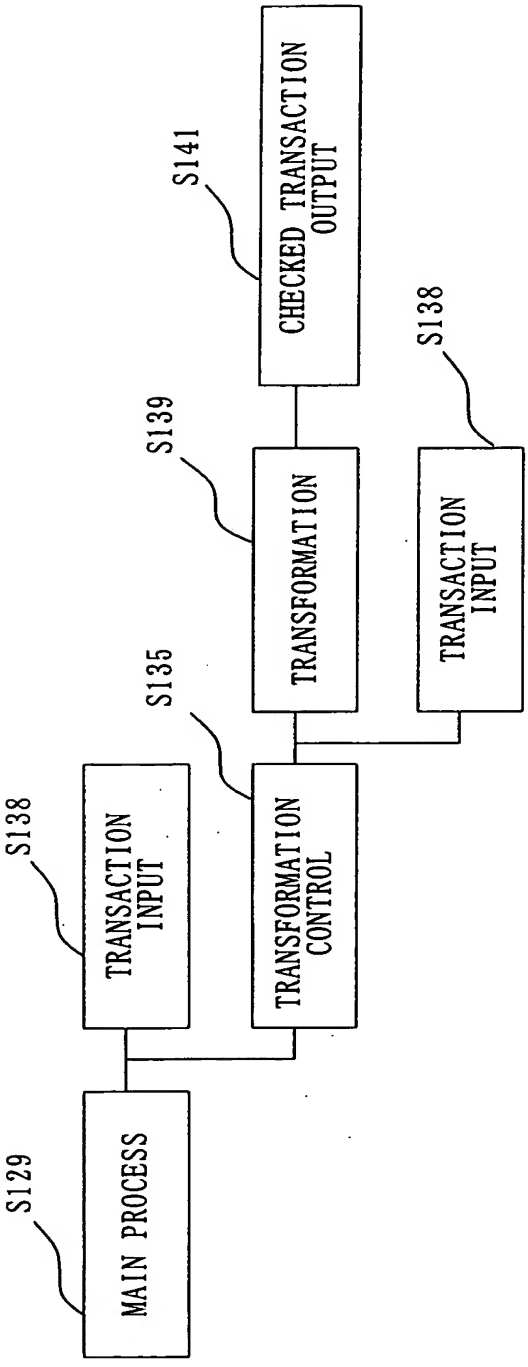

S129
MAIN PROCESS
S138
TRANSACTION INPUT
S135
TRANSFORMATION CONTROL
S139
TRANSFORMATION
S138
TRANSACTION INPUT
S141
CHECKED TRANSACTION OUTPUT

Fig.10

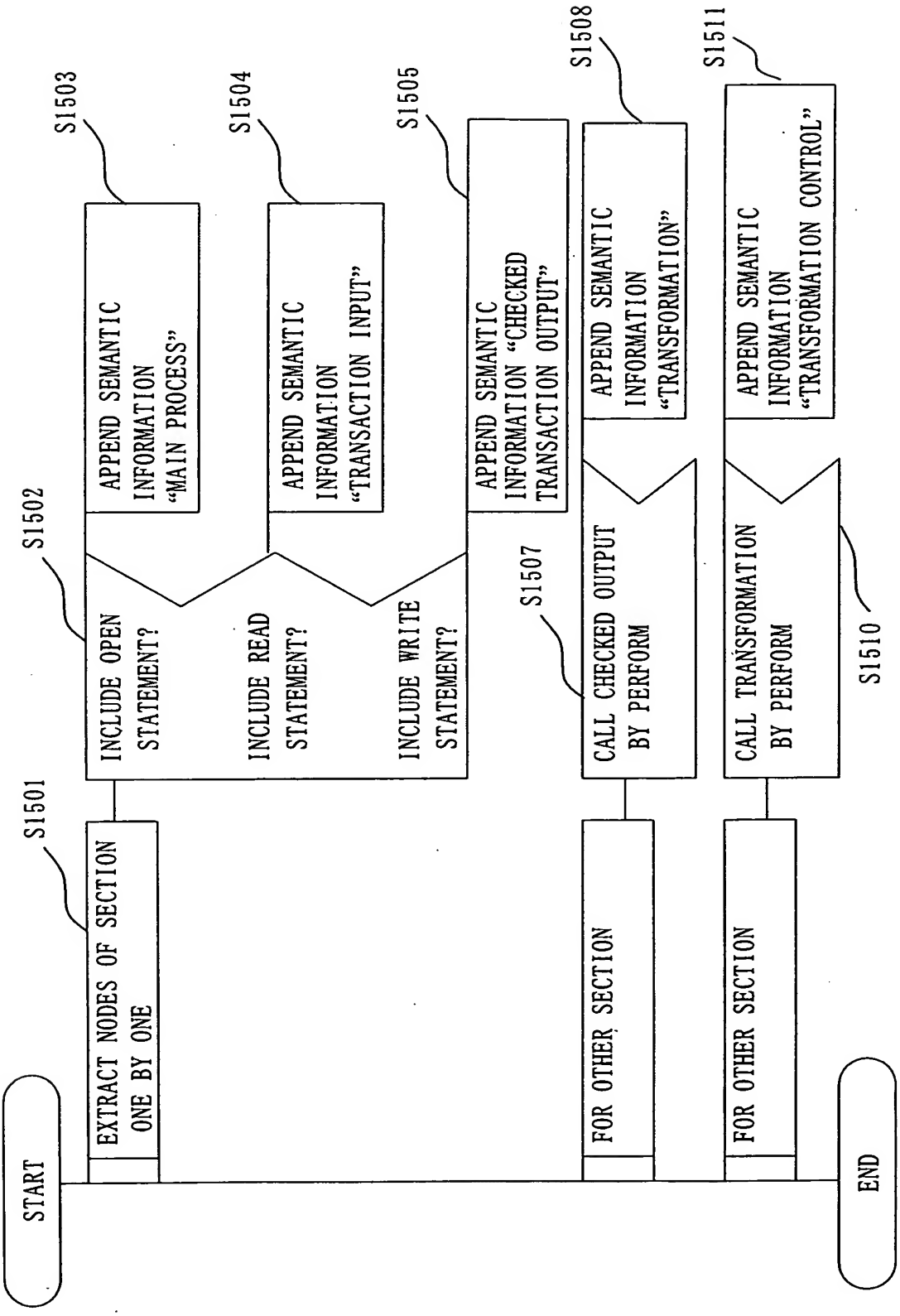

START
EXTRACT NODES OF SECTION ONE BY ONE
S1501
INCLUDE OPEN STATEMENT?
S1502
APPEND SEMANTIC INFORMATION "MAIN PROCESS"
S1503
INCLUDE READ STATEMENT?
APPEND SEMANTIC INFORMATION "TRANSACTION INPUT"
S1504
INCLUDE WRITE STATEMENT?
APPEND SEMANTIC INFORMATION "CHECKED TRANSACTION OUTPUT"
S1505
FOR OTHER SECTION
CALL CHECKED OUTPUT BY PERFORM
S1507
APPEND SEMANTIC INFORMATION "TRANSFORMATION"
S1508
FOR OTHER SECTION
CALL TRANSFORMATION BY PERFORM
S1510
APPEND SEMANTIC INFORMATION "TRANSFORMATION CONTROL"
S1511
END

Fig.11

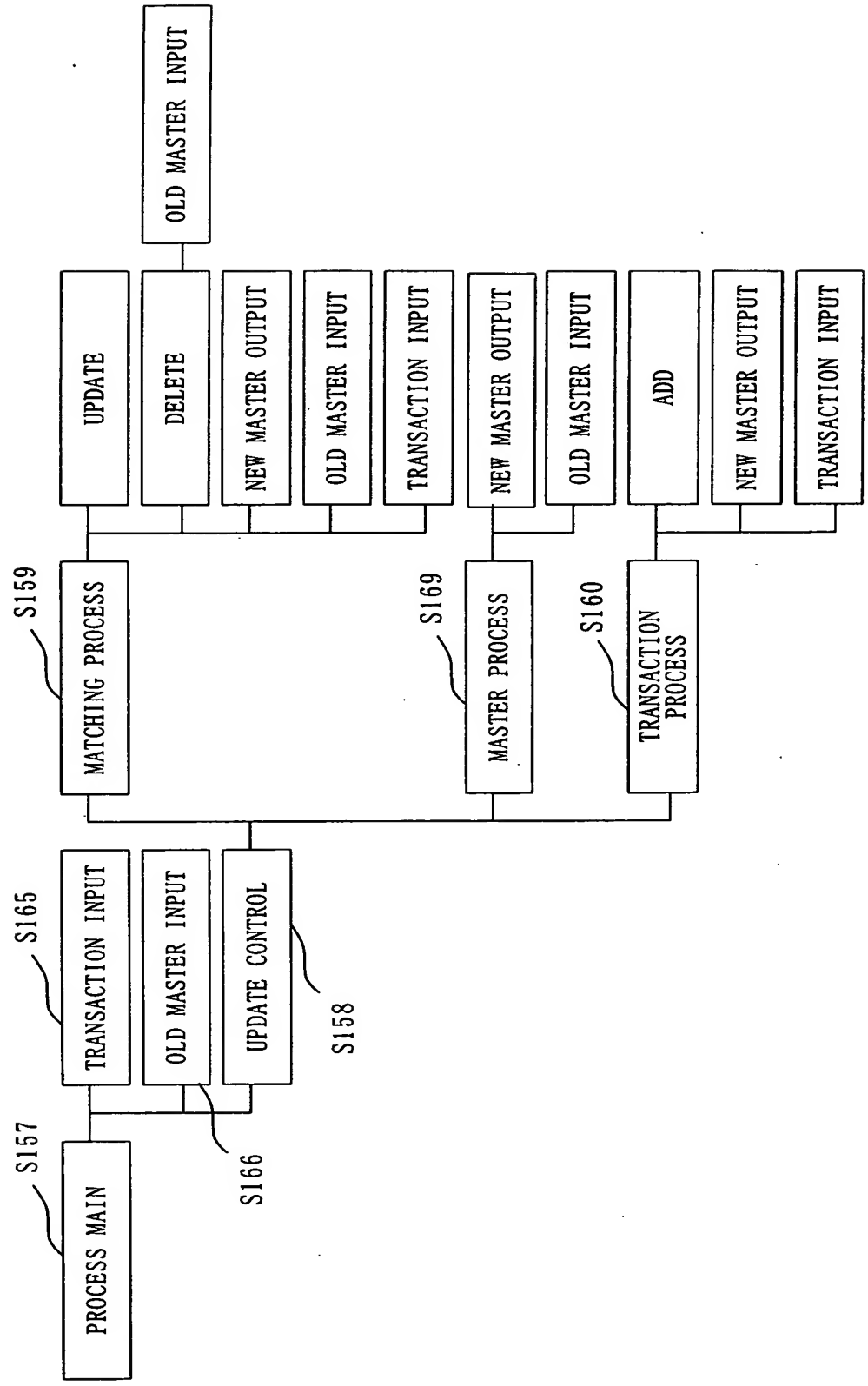

OLD MASTER INPUT
UPDATE
DELETE
NEW MASTER OUTPUT
OLD MASTER INPUT
TRANSACTION INPUT
NEW MASTER OUTPUT
OLD MASTER INPUT
ADD
NEW MASTER OUTPUT
TRANSACTION INPUT
S159
MATCHING PROCESS
S169
MASTER PROCESS
S160
TRANSACTION PROCESS
S165
TRANSACTION INPUT
OLD MASTER INPUT
UPDATE CONTROL
S158
S157
PROCESS MAIN
S166

Fig.12

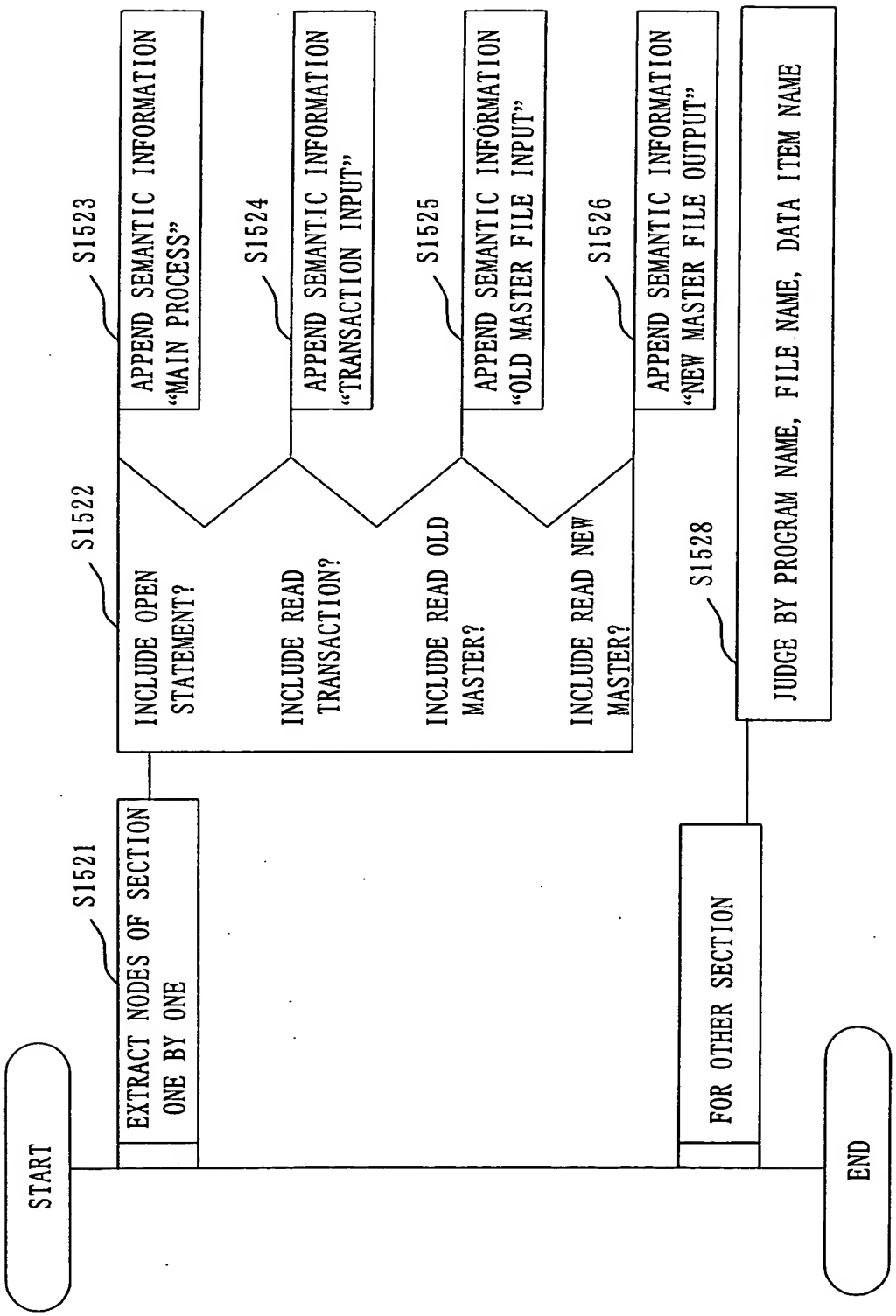

START
S1521
EXTRACT NODES OF SECTION ONE BY ONE
S1522
INCLUDE OPEN STATEMENT?
S1523
APPEND SEMANTIC INFORMATION "MAIN PROCESS"
INCLUDE READ TRANSACTION?
S1524
APPEND SEMANTIC INFORMATION "TRANSACTION INPUT"
INCLUDE READ OLD MASTER?
S1525
APPEND SEMANTIC INFORMATION "OLD MASTER FILE INPUT"
INCLUDE READ NEW MASTER?
S1526
APPEND SEMANTIC INFORMATION "NEW MASTER FILE OUTPUT"
FOR OTHER SECTION
S1528
JUDGE BY PROGRAM NAME, FILE NAME, DATA ITEM NAME
END

Fig.13

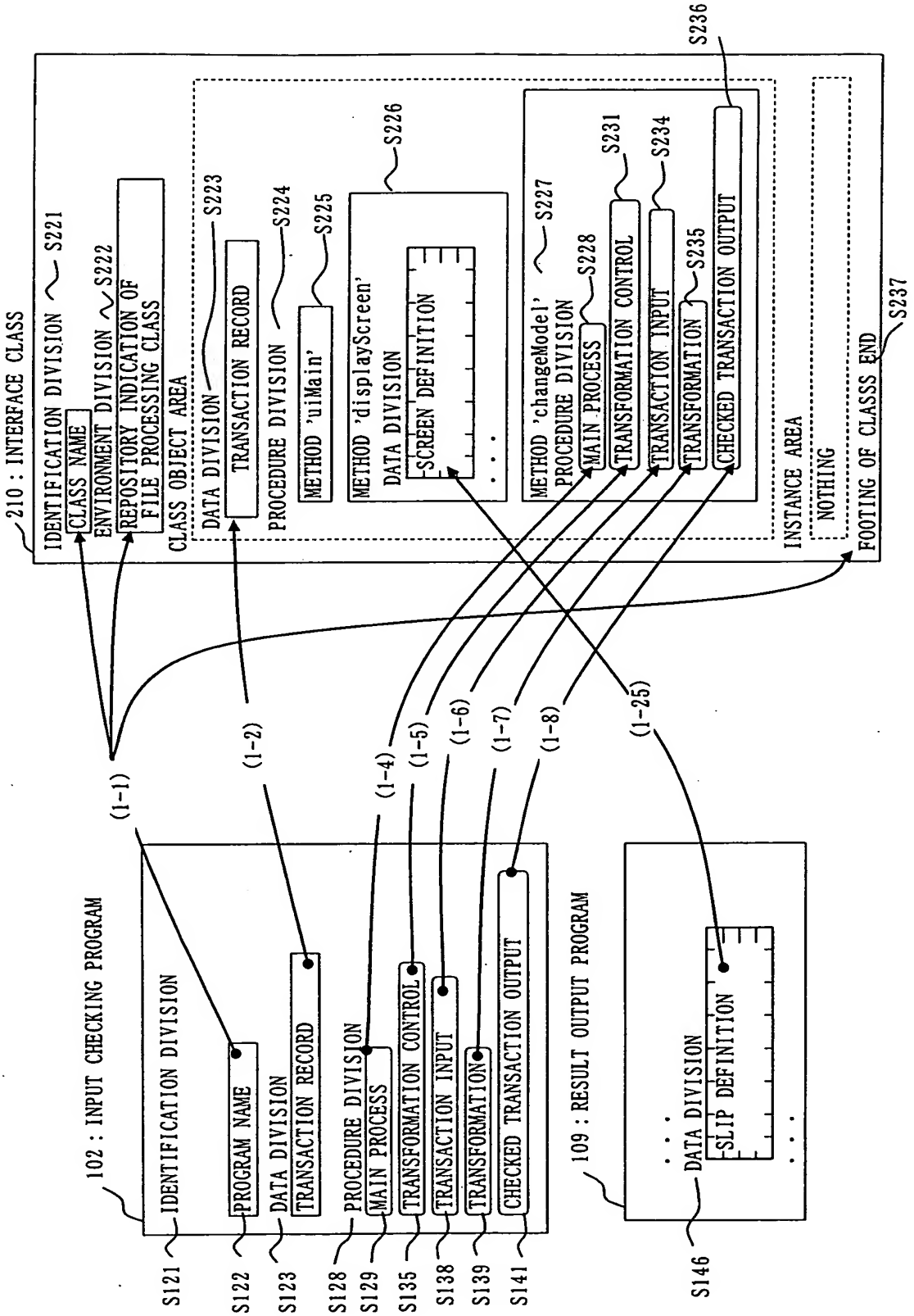
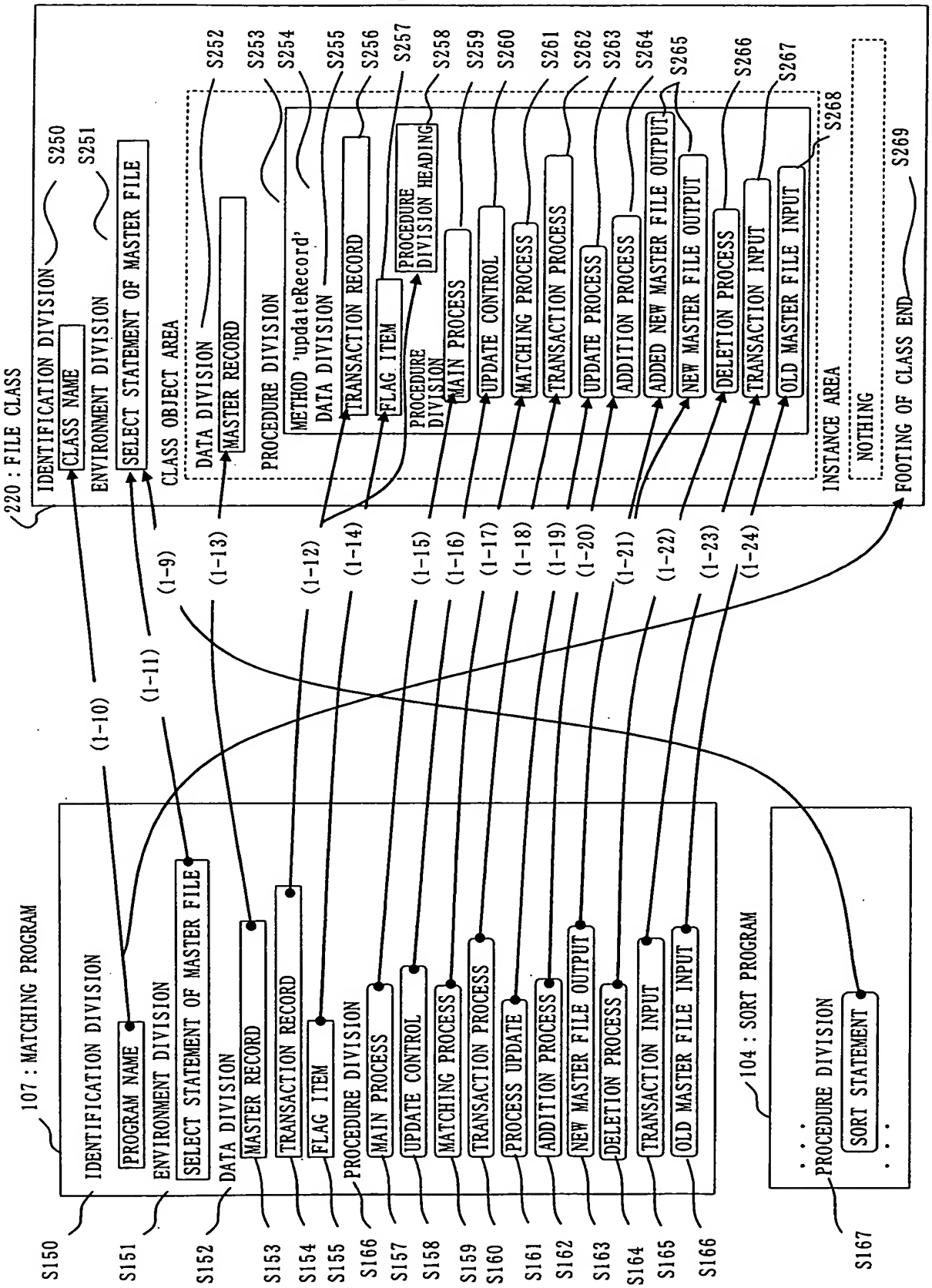

210 : INTERFACE CLASS
IDENTIFICATION DIVISION
CLASS NAME
ENVIRONMENT DIVISION
REPOSITORY INDICATION OF FILE PROCESSING CLASS
CLASS OBJECT AREA
DATA DIVISION
TRANSACTION RECORD
PROCEDURE DIVISION
METHOD 'uiMain'
METHOD 'displayScreen'
DATA DIVISION
SCREEN DEFINITION
METHOD 'changeModel'
PROCEDURE DIVISION
MAIN PROCESS
TRANSFORMATION CONTROL
TRANSACTION INPUT
TRANSFORMATION
CHECKED TRANSACTION OUTPUT
INSTANCE AREA
NOTHING
FOOTING OF CLASSS END
S221
S222
S223
S224
S225
S226
S227
S228
S231
S234
S235
S236
S237
(1-1)
(1-2)
(1-4)
(1-5)
(1-6)
(1-7)
(1-8)
(1-25)
102 : INPUT CHECKING PROGRAM
IDENTIFICATION DIVISION
PROGRAM NAME
DATA DIVISION
TRANSACTION RECORD
PROCEDURE DIVISION
MAIN PROCESS
TRANSFORMATION CONTROL
TRANSACTION INPUT
TRANSFORMATION
CHECKED TRANSACTION OUTPUT
S121
S122
S123
S128
S129
S135
S138
S139
S141
109 : RESULT OUTPUT PROGRAM
DATA DIVISION
SLIP DEFINITION
S146

Fig.14


220 : FILE CLASS
IDENTIFICATION DIVISION
CLASS NAME
ENVIRONMENT DIVISION
SELECT STATEMENT OF MASTER FILE
CLASS OBJECT AREA
DATA DIVISION
MASTER RECORD
PROCEDURE DIVISION
METHOD 'updateRecord'
DATA DIVISION
TRANSACTION RECORD
FLAG ITEM
PROCEDURE DIVISION
PROCEDURE DIVISION HEADING
MAIN PROCESS
UPDATE CONTROL
MATCHING PROCESS
TRANSACTION PROCESS
UPDATE PROCESS
ADDITION PROCESS
ADDED NEW MASTER FILE OUTPUT
NEW MASTER FILE OUTPUT
DELETION PROCESS
TRANSACTION INPUT
OLD MASTER FILE INPUT
INSTANCE AREA
NOTHING
FOOTING OF CLASS END
S250
S251
S252
S253
S254
S255
S256
S257
S258
S259
S260
S261
S262
S263
S264
S265
S266
S267
S268
S269
(1-9)
(1-10)
(1-11)
(1-12)
(1-13)
(1-14)
(1-15)
(1-16)
(1-17)
(1-18)
(1-19)
(1-20)
(1-21)
(1-22)
(1-23)
(1-24)
107 : MATCHING PROGRAM
IDENTIFICATION DIVISION
PROGRAM NAME
ENVIRONMENT DIVISION
SELECT STATEMENT OF MASTER FILE
DATA DIVISION
MASTER RECORD
TRANSACTION RECORD
FLAG ITEM
PROCEDURE DIVISION
MAIN PROCESS
UPDATE CONTROL
MATCHING PROCESS
TRANSACTION PROCESS
PROCESS UPDATE
ADDITION PROCESS
NEW MASTER FILE OUTPUT
DELETION PROCESS
TRANSACTION INPUT
OLD MASTER FILE INPUT
104 : SORT PROGRAM
PROCEDURE DIVISION
SORT STATEMENT
S150
S151
S152
S153
S154
S155
S166
S157
S158
S159
S160
S161
S162
S163
S164
S165
S166
S167

LOCATION NUMBER	COMPONENT TO BE EXTRACTED	LOCATION AFTER TRANSFORMATION	HOW TO FIND FOR EXTRACTION	STRUCTURAL, SYNTAX TRANSFORMATION	REASON FOR THIS EXTRACTION/TRANSFORMATION
ORIGIN OF EXTRACTION: IDENTIFICATION DIVISION					
(1-1)	PROGRAM NAME	CLASS NAME	EXTRACT FROM PARAGRAPH OF PROGRAM-ID	・CHANGE AFFIX OF INPUT CHECKING PROGRAM TO AFFIX OF UI CLASS	
		ENVIRONMENT DIVISION INTERNAL NAME FOR REPOSITORY INDICATION FOR FILE CLASS	〃	・APPEND AFFIX OF FILE CLASS ・FOR EXTERNAL NAME, INSERT FILE NAME OF FILE CLASS ACCORDING TO NAMING RULE	
		FOOTING OF CLASS END	〃	THE SAME AS CLASS NAME	
ORIGIN OF EXTRACTION: DATA DIVISION					
(1-2)	DEFINITION OF TRANSACTION RECORD	CLASS VARIABLE → WS SECTION	FIND AFFIX OF TRANSACTION FILE APPENDED		SEND INPUT FROM SCREEN TO FILE CLASS IN A RECORD FORMAT
ORIGIN OF EXTRACTION: PROCEDURE DIVISION → DESTINATION: UI CLASS, CLASS METHOD, INPUT CHECKING METHOD					
(1-4)	MAIN PROCESS	PROCEDURE DIVISION OF INPUT CHECKING METHOD	KNOWN BY PREPROCESSING	a. DELETE "OPEN," "CLOSE" STATEMENTS OF FILE b. DELETE REPEATING INDICATION ("UNTIL") FROM "PERFORM" STATEMENT FOR TRANSFORMATION CONTROL c. REPLACE "STOP RUN" WITH "EXIT METHOD"	a. IN UI CLASS, INPUT IS DONE FROM SCREEN, CHECKED RECORD IS OUTPUT TO FILE CLASS b. PROCESSES ONLY ONE RECORD
(1-5)	TRANSFORMATION CONTROL	〃	〃	DELETE "PERFORM" STATEMENT FOR TRANSACTION INPUT	DOES NOT INPUT NEXT TRANSACTION RECORD SINCE ONLY ONE RECORD IS PROCESSED
(1-6)	TRANSACTION INPUT	〃	〃	REPLACE "READ" STATEMENT FROM TRANSACTION FILE WITH "CONTINUE" STATEMENT	INPUT DATA FROM SCREEN IS DIRECTLY ENTERED IN TRANSACTION RECORD
(1-7)	TRANSFORMATION	〃	〃	DELETE "MOVE" STATEMENT FROM TRANSACTION RECORD TO CHECKED TRANSACTION RECORD	CHECK TRANSACTION RECORD, AND SEND IT TO FILE CLASS IF DATA IS CORRECT
(1-8)	CHECKED TRANSACTION OUTPUT	〃	〃	DELETE "WRITE" STATEMENT TO CHECKED TRANSACTION FILE, REPLACE BY "INVOKE" STATEMENT TO MATCHING AND UPDATING METHOD IN FILE CLASS	CHECKED RECORD BECOMES PARAMETER FOR MATCHING AND UPDATING METHOD

Fig.15

15 /69

Replacement Sheet

Fig.16

LOCATION NUMBER	COMPONENT TO BE EXTRACTED	LOCATION AFTER TRANSFORMATION	HOW TO FIND FOR EXTRACTION	STRUCTURAL, SYNTAX TRANSFORMATION	REASON FOR THIS EXTRACTION/ TRANSFORMATION
(1-25)	SLIP DEFINITION	SCREEN DISPLAYING METHOD SCREEN DEFINITION	EXTRACT SLIP ITEM OF "TYPE DETAIL" IN REPORT SECTION	a. CORRESPOND LINE LOCATION, DIGIT LOCATION OF SLIP TO LINE LOCATION, DIGIT LOCATION OF SCREEN b. REPLACE "SOURCE" INDICATION OF SLIP ITEM BY "TO" INDICATION OF SCREEN ITEM c. GENERATE SCREEN ITEM BASED ON DATA ITEM THAT IS INCLUDED IN TRANSACTION RECORD BUT NOT INCLUDED IN MASTER RECORD	c. RESULT OUTPUT PROGRAM OUTPUTS ITEMS OF MASTER RECORD, TRANSACTION ITEMS ARE INPUT FROM SCREEN

Fig.17

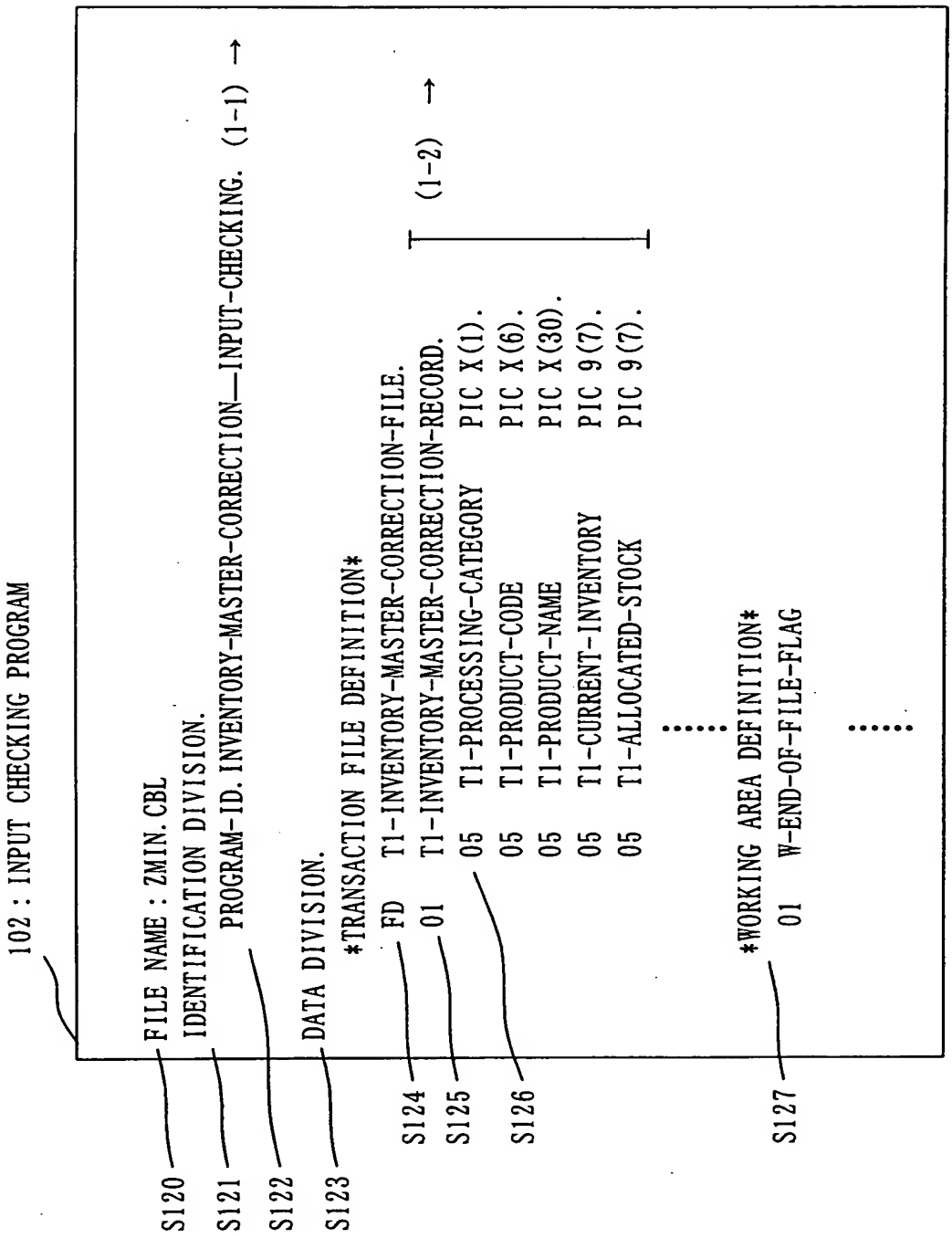

102 : INPUT CHECKING PROGRAM
FILE NAME : ZMIN.CBL
IDENTIFICATION DIVISION.
PROGRAM-ID. INVENTORY-MASTER-CORRECTION—INPUT-CHECKING. (1-1) →
DATA DIVISION.
TRANSACTION FILE DEFINITION
FD T1-INVENTORY-MASTER-CORRECTION-FILE.
01 T1-INVENTORY-MASTER-CORRECTION-RECORD. (1-2) →
05 T1-PROCESSING-CATEGORY PIC X(1).
05 T1-PRODUCT-CODE PIC X(6).
05 T1-PRODUCT-NAME PIC X(30).
05 T1-CURRENT-INVENTORY PIC 9(7).
05 T1-ALLOCATED-STOCK PIC 9(7).
WORKING AREA DEFINITION
01 W-END-OF-FILE-FLAG
S120
S121
S122
S123
S124
S125
S126
S127

Fig.18

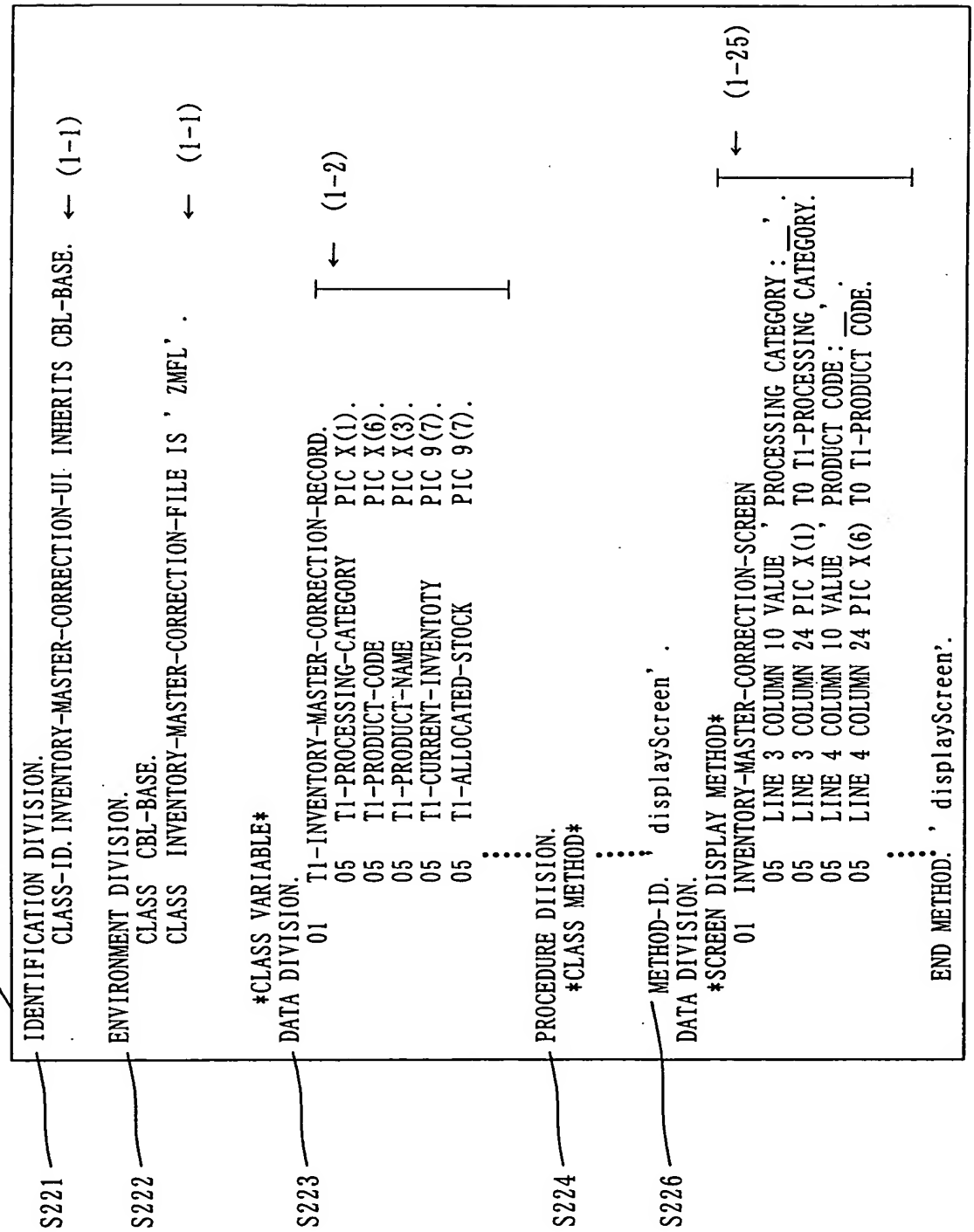

210 : INTERFACE CLASS
IDENTIFICATION DIVISION.
CLASS-ID. INVENTORY-MASTER-CORRECTION-UI INHERITS CBL-BASE. ← (1-1)
ENVIRONMENT DIVISION.
CLASS CBL-BASE.
CLASS INVENTORY-MASTER-CORRECTION-FILE IS ' ZMFL'. ← (1-1)
CLASS VARIABLE
DATA DIVISION.
01 T1-INVENTORY-MASTER-CORRECTION-RECORD.
05 T1-PROCESSING-CATEGORY PIC X(1).
05 T1-PRODUCT-CODE PIC X(6).
05 T1-PRODUCT-NAME PIC X(3).
05 T1-CURRENT-INVENTOTY PIC 9(7).
05 T1-ALLOCATED-STOCK PIC 9(7).
← (1-2)
PROCEDURE DIISION.
CLASS METHOD
METHOD-ID. ' displayScreen'.
DATA DIVISION.
SCREEN DISPLAY METHOD
01 INVENTORY-MASTER-CORRECTION-SCREEN
05 LINE 3 COLUMN 10 VALUE ' PROCESSING CATEGORY: '.
05 LINE 3 COLUMN 24 PIC X(1) TO T1-PROCESSING CATEGORY.
05 LINE 4 COLUMN 10 VALUE ' PRODUCT CODE: '.
05 LINE 4 COLUMN 24 PIC X(6) TO T1-PRODUCT CODE.
← (1-25)
END METHOD ' displayScreen'.
S221
S222
S223
S224
S226

Fig.19

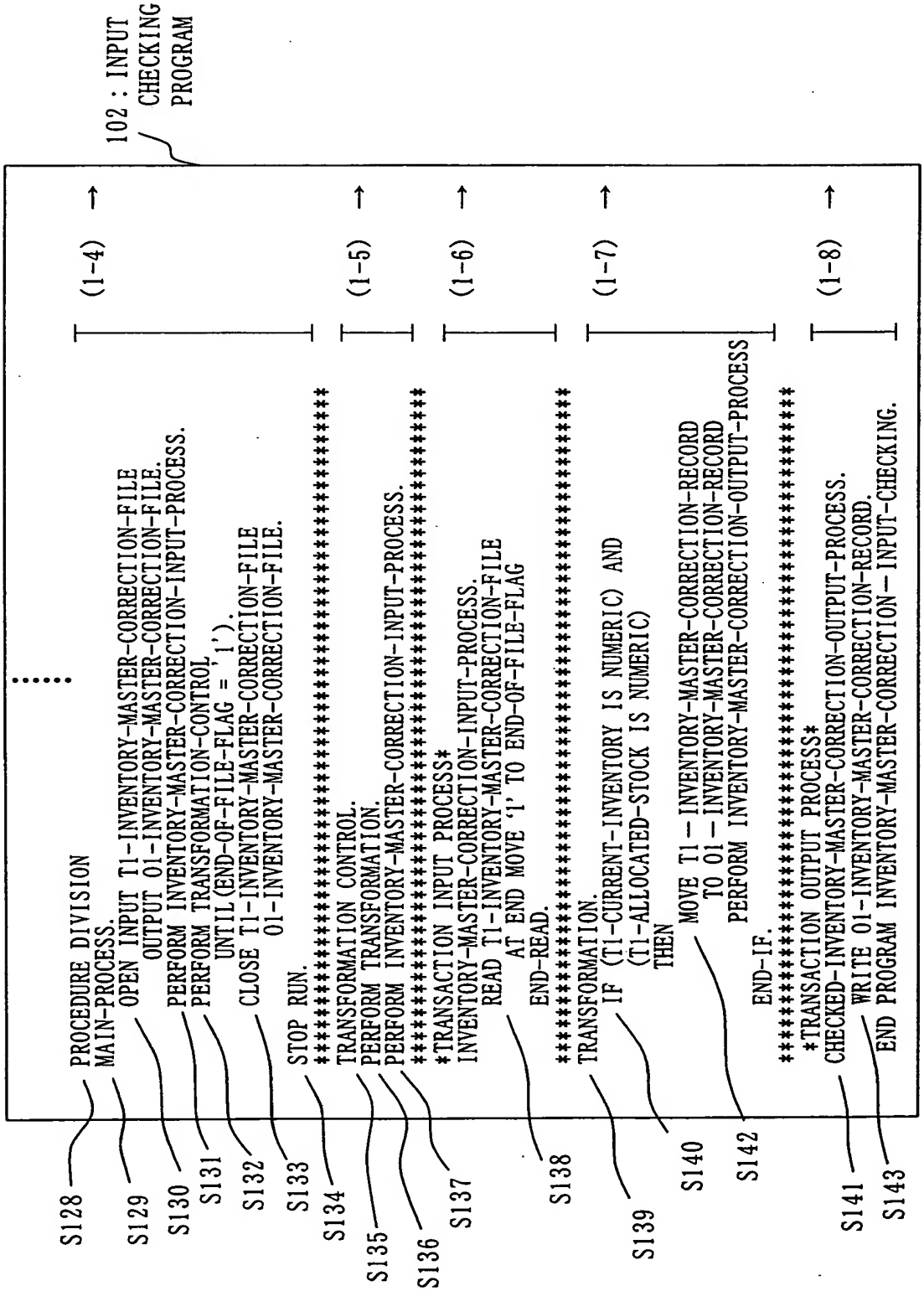

102 : INPUT CHECKING PROGRAM
PROCEDURE DIVISION
MAIN-PROCESS.
OPEN INPUT T1-INVENTORY-MASTER-CORRECTION-FILE
OUTPUT 01-INVENTORY-MASTER-CORRECTION-FILE.
PERFORM INVENTORY-MASTER-CORRECTION-INPUT-PROCESS.
PERFORM TRANSFORMATION-CONTROL
UNTIL(END-OF-FILE-FLAG = '1').
CLOSE T1-INVENTORY-MASTER-CORRECTION-FILE
01-INVENTORY-MASTER-CORRECTION-FILE.
STOP RUN.
TRANSFORMATION CONTROL.
PERFORM TRANSFORMATION.
PERFORM INVENTORY-MASTER-CORRECTION-INPUT-PROCESS.
TRANSACTION INPUT PROCESS
INVENTORY-MASTER-CORRECTION-INPUT-PROCESS.
READ T1-INVENTORY-MASTER-CORRECTION-FILE
AT END MOVE '1' TO END-OF-FILE-FLAG
END-READ.
TRANSFORMATION.
IF (T1-CURRENT-INVENTORY IS NUMERIC) AND
(T1-ALLOCATED-STOCK IS NUMERIC)
THEN
MOVE T1 -- INVENTORY-MASTER-CORRECTION-RECORD
TO 01 -- INVENTORY-MASTER-CORRECTION-RECORD
PERFORM INVENTORY-MASTER-CORRECTION-OUTPUT-PROCESS
END-IF.
TRANSACTION OUTPUT PROCESS
CHECKED-INVENTORY-MASTER-CORRECTION-OUTPUT-PROCESS.
WRITE 01-INVENTORY-MASTER-CORRECTION-RECORD.
END PROGRAM INVENTORY-MASTER-CORRECTION-- INPUT-CHECKING.
(1-4)
(1-5)
(1-6)
(1-7)
(1-8)
S128
S129
S130
S131
S132
S133
S134
S135
S136
S137
S138
S139
S140
S142
S141
S143

Fig. 20

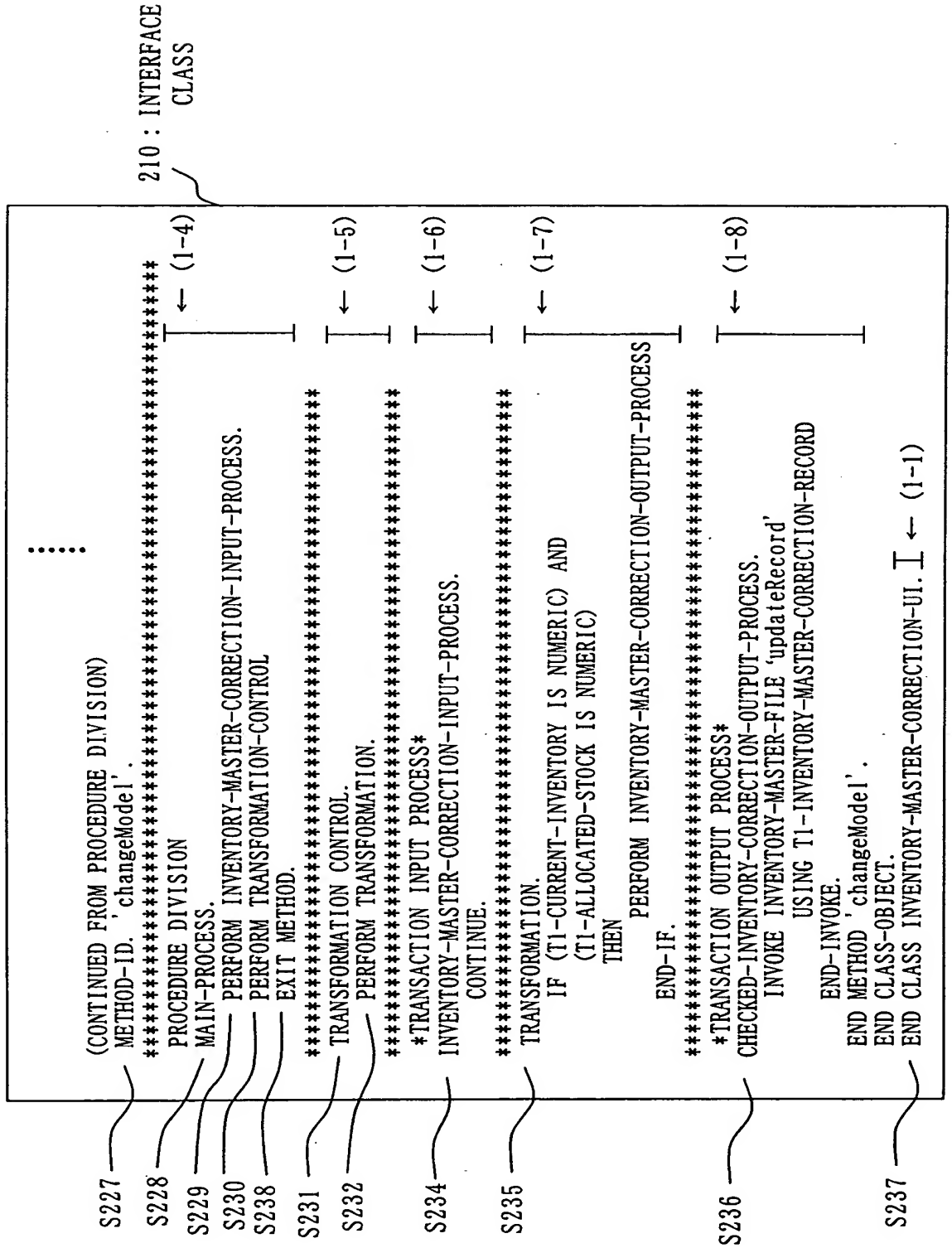

210 : INTERFACE CLASS
(CONTINUED FROM PROCEDURE DIVISION)
METHOD-ID. 'changeModel'.
****
PROCEDURE DIVISION
MAIN-PROCESS.
PERFORM INVENTORY-MASTER-CORRECTION-INPUT-PROCESS.
PERFORM TRANSFORMATION-CONTROL
EXIT METHOD.
****
TRANSFORMATION CONTROL.
PERFORM TRANSFORMATION.
****
TRANSACTION INPUT PROCESS
INVENTORY-MASTER-CORRECTION-INPUT-PROCESS.
CONTINUE.
****
TRANSFORMATION.
IF (T1-CURRENT-INVENTORY IS NUMERIC) AND
(T1-ALLOCATED-STOCK IS NUMERIC)
THEN
PERFORM INVENTORY-MASTER-CORRECTION-OUTPUT-PROCESS
END-IF.
****
TRANSACTION OUTPUT PROCESS
CHECKED-INVENTORY-CORRECTION-OUTPUT-PROCESS.
INVOKE INVENTORY-MASTER-FILE 'updateRecord'
USING T1-INVENTORY-MASTER-CORRECTION-RECORD
END-INVOKE.
END METHOD 'changeModel'.
END CLASS-OBJECT.
END CLASS INVENTORY-MASTER-CORRECTION-UI.
(1-4)
(1-5)
(1-6)
(1-7)
(1-8)
(1-1)
S227
S228
S229
S230
S238
S231
S232
S234
S235
S236
S237

Fig. 21

11. INPUT CHECKIN1. INPUT CHECKING PROGRAM (BEFORE TRANSFORMATION)

FILE NAME : ZMIN.CBL

```
000001 IDENTIFICATION DIVISION.
000002 PROGRAM-ID. INVENTORY-MASTER-CORRECTION-INPUT-CHECKING.
000003 ENVIRONMENT DIVISION.
000004 INPUT-OUTPUT SECTION.
000005 FILE-CONTROL.
000006     SELECT T1-INVENTORY-MASTER-CORRECTION-FILE ASSIGN TO SYS010-UT-MT-S.
000008     SELECT O1-INVENTORY-MASTER-CORRECTION-FILE ASSIGN TO SYS020-DA-DK-S.
000010 DATA DIVISION.
000011 FILE SECTION.
000012 FD  T1-INVENTORY-MASTER-CORRECTION-FILE.
000013 01  T1-INVENTORY-MASTER-CORRECTION-RECORD.
000014     05  T1-PROCESSING-CATEGORY     PIC X(1).
000015     05  T1-PRODUCT-CODE            PIC X(6).
000016     05  T1-PRODUCT-NAME            PIC X(30).
000017     05  T1-CURRENT-INVENTORY       PIC 9(7).
000018     05  T1-ALLOCATED-STOCK         PIC 9(7).
000019     05  T1-POINT-OF-ORDERING       PIC 9(7).
000020     05  T1-BASE-INVENTORY          PIC 9(7).
000021     05  T1-SUPPLYER-CODE           PIC X(5).
000022 FD  O1-INVENTORY-MASTER-CORRECTION-FILE.
000023 01  O1-INVENTORY-MASTER-CORRECTION-RECORD.
000024     05  O1-PROCESSING-CATEGORY     PIC X(1).
000025     05  O1-PRODUCT-CODE            PIC X(6).
000026     05  O1-PRODUCT-NAME            PIC X(30).
000027     05  O1-CURRENT-INVENTORY       PIC 9(7).
000028     05  O1-ALLOCATED-STOCK         PIC 9(7).
000029     05  O1-POINT-OF-ORDERING       PIC 9(7).
000030     05  O1-BASE-INVENTORY          PIC 9(7).
000031     05  O1-SUPPLYER-CODE           PIC X(5).
000036 PROCEDURE DIVISION.
000037 MAIN PROCESS.
000038     OPEN INPUT T1-INVENTORY-MASTER-CORRECTION-FILE
000039         OUTPUT O1-INVENTORY-MASTER-CORRECTION-FILE.
000040     PERFORM INVENTORY-MASTER-CORRECTION-INPUT.
000041     PERFORM TRANSFORMATION-CONTROL
000042         UNTIL(FILE-END-FLAG = '1').
000043     CLOSE T1-INVENTORY-MASTER-CORRECTION-FILE
000044           O1-INVENTORY-MASTER-CORRECTION-FILE.
000045     STOP RUN.
000046*****************************************************************
000047 TRANSFORMATION-CONTROL.
000048     PERFORM TRANSFORMATION.
000049     PERFORM INVENTORY-MASTER-CORRECTION-INPUT.
000050*****************************************************************
000051 INVENTORY-MASTER-CORRECTION-INPUT.
000052     READ T1-INVENTORY-MASTER-CORRECTION-FILE
000053         AT END MOVE '1' TO FILE-END-FLAG
000054     END-READ.
000055*****************************************************************
000056 TRANSFORMATION.
000057     IF (T1-CURRENT-INVENTORY IS NUMERIC) AND
000058        (T1-ALLOCATED-STOCK   IS NUMERIC)
000059        THEN
000060            MOVE T1-INVENTORY-MASTER-CORRECTION-RECORD
000061              TO O1-INVENTORY-MASTER-CORRECTION-RECORD
000062            PERFORM CHECKEDINVENTORY-MASTER-CORRECTION-OUTPUT
000063     END-IF.
000064*****************************************************************
000065 CHECKEDINVENTORY-MASTER-CORRECTION OUTPUT.
000066     WRITE O1-INVENTORY-MASTER-CORRECTION-RECORD.
000067 END PROGRAM INVENTORY-MASTER-CORRECTION-INPUT-CHECKING.
```

(1-1) →
(1-2) →
(1-4) →
(1-5) →
(1-6) →
(1-7) →
(1-8) →

Fig.22

5. INTERFACE CLASS (INTERMEDIATE PROGRAM)

```
FILE NAME : ZMUI.CBL
000001 IDENTIFICATION DIVISION.
000002 CLASS-ID. INVENTORY-MASTER-CORRECTION-UI INHERITS CBL-BASE.
000003 ENVIRONMENT DIVISION.
000004 CONFIGURATION SECTION.
000005 REPOSITORY.
000006     CLASS CBL-BASE.
000007     CLASS INVENTORY-MASTER-CORRECTION-FILE IS 'ZMFL'.
000008 IDENTIFICATION DIVISION.
000009 CLASS-OBJECT.
000010 DATA DIVISION.
000011*****************************************************************
000012* CLASS VARIABLE
000013*****************************************************************
000014 WORKING-STORAGE SECTION.
000015 01  T1-INVENTORY-MASTER-CORRECTION-RECORD.
000016     05  T1-PROCESSING-CATEGORY     PIC X(1).
000017     05  T1-PRODUCT-CODE            PIC X(6).
000018     05  T1-PRODUCT-NAME            PIC X(30).
000019     05  T1-CURRENT-INVENTORY       PIC 9(7).
000020     05  T1-ALLOCATED-STOCK         PIC 9(7).
000021     05  T1-POINT-OF-ORDERING       PIC 9(7).
000022     05  T1-BASE-INVENTORY          PIC 9(7).
000023     05  T1-SUPPLYER-CODE           PIC X(5).
000024 01  END-FLAG PIC X(1).
000025 PROCEDURE DIVISION.
000026*****************************************************************
000027* CLASS METHOD
000028*****************************************************************
000029 IDENTIFICATION DIVISION.
000030 METHOD-ID. 'displayScreen'.
000031*****************************************************************
000032 DATA DIVISION.
000033 SCREEN SECTION.
000034 01  INVENTORY-MASTER-DETAIL.
000035     05  LINE  3 COLUMN 10 VALUE 'PROCESSING CATEGORY    : _'.
000036     05  LINE  3 COLUMN 24 PIC X(1) TO T1-PROCESSING-CATEGORY.
000037     05  LINE  4 COLUMN 10 VALUE 'PRODUCT CODE  : ______'.
000038     05  LINE  4 COLUMN 24 PIC X(6) TO T1-PRODUCT-CODE.
000039     05  LINE  5 COLUMN 10 VALUE 'PRODUCT NAME      : ______________________________'.
000040     05  LINE  5 COLUMN 24 PIC X(30) TO T1-PRODUCT-NAME.
000041     05  LINE  6 COLUMN 10 VALUE 'CURRENT INVENTORY    : _______'.
000042     05  LINE  6 COLUMN 24 PIC 9(7) TO T1-CURRENT-INVENTORY.
000043     05  LINE  7 COLUMN 10 VALUE 'ALLOCATED STOCK      : _______'.
000044     05  LINE  7 COLUMN 24 PIC 9(7) TO T1-ALLOCATED-STOCK.
000045     05  LINE  8 COLUMN 10 VALUE 'POINT OF ORDERING      : _______'.
000046     05  LINE  8 COLUMN 24 PIC 9(7) TO T1-POINT-OF-ORDERING.
000047     05  LINE  9 COLUMN 10 VALUE 'BASE INVENTORY  : _______'.
000048     05  LINE  9 COLUMN 24 PIC 9(7) TO T1-BASE-INVENTORY.
000049     05  LINE 10 COLUMN 10 VALUE 'SUPPLYER CODE: _____'.
000050     05  LINE 10 COLUMN 24 PIC X(5) TO T1-SUPPLYER-CODE.
000051     05  LINE 11 COLUMN 40 VALUE 'END        : _':
000052     05  LINE 11 COLUMN 24 PIC X(1) TO END-FLAG.
000053 PROCEDURE DIVISION.
000054     DISPLAY INVENTORY-MASTER-DETAIL.
000055     ACCEPT  INVENTORY-MASTER-DETAIL.
000056     EXIT METHOD.
000057 END METHOD. 'displayScreen'.
000058
```

(1-1) (2-1) (1-1) (1-2) (2-2) (2-3) (1-25)

Fig. 23

(5. INTERFACE CLASS —CONTINUED)

```
000059*****************************************************************************
000060 IDENTIFICATION DIVISION.                                                      ] (2-4) →
000061 METHOD-ID. 'uiMain'.
000062*****************************************************************************
000063 PROCEDURE DIVISION.
000064     PERFORM UNTIL (END FLAG = '1')
000065         INVOKE SELF 'displayScreen'
000066         INVOKE SELF 'changeModel'
000067     END-PERFORM.
000068     EXIT METHOD.
000069 END METHOD 'uiMain'.
000070
000071*****************************************************************************
000072 IDENTIFICATION DIVISION.
000073 METHOD-ID. 'changeModel'.
000074*****************************************************************************
000075 PROCEDURE DIVISION.
000076 MAIN-PROCESS.                                                                 ]← (1-4)
000077     PERFORM INVENTORY-MASTER-CORRECTION-INPUT.                                 (2-5) →
000078     PERFORM TRANSFORMATION-CONTROL
000079     EXIT METHOD.
000080*************************************************************
000081 TRANSFORMATION-CONTROL.                                                       ]← (1-5)
000082     PERFORM TRANSFORMATION.                                                   (2-6) →
000083*************************************************************
000084 INVENTORY-MASTER-CORRECTION-INPUT.                                              ]← (1-6)
000085     CONTINUE.                                                                   (2-7) →
000086*************************************************************
000087 TRANSFORMATION.                                                                ]← (1-7)
000088     IF (T1-CURRENT-INVENTORY IS NUMERIC) AND
000089        (T1-ALLOCATED-STOCK   IS NUMERIC)                                       (2-8) →
000090        THEN
000091            PERFORM CHECKED-INVENTORY-MASTER-CORRECTION-OUTPUT
000092     END-IF.
000093*************************************************************
000094 CHECKEDINVENTORY-MASTER-CORRECTION-OUTPUT.                                    ]← (1-8)
000095     INVOKE INVENTORY-MASTER-FILE 'updateRecord'                               (2-9) →
000096            USING T1-INVENTORY-MASTER-CORRECTION-RECORD
000097     END-INVOKE.
000098 END METHOD 'changeModel'.
000099 END CLASS-OBJECT.
000100 END CLASS INVENTORY-MASTER-CORRECTION-UI.                                  ]← (1-1)
```

Fig. 24

4. RESULT OUTPUT PROGRAM

FILE NAME : ZMOT.CBL

```
000001 IDENTIFICATION DIVISION.
000002 PROGRAM-ID. INVENTORY-MASTER-CORRECTION－RESULT-OUTPUT.
000003 ENVIRONMENT DIVISION.
000004 INPUT-OUTPUT SECTION.
000005 FILE-CONTROL.
000006     SELECT T1-INVENTORY-MASTER-FILE
000007            ASSIGN TO SYS010-DA-DK-S.
000008     SELECT 01-OUTPUT-FILE
000009            ASSIGN TO SYS020-UR-LP-S.
000010 DATA DIVISION.
000011 FILE SECTION.
000012 FD  T1-INVENTORY-MASTER-FILE BLOCK CONTAINS 35 RECORDS.
000013 01  T1-INVENTORY-MASTER-RECORD.
000014     05  T1-PRODUCT-CODE          PIC X(6).
000015     05  T1-PRODUCT-NAME          PIC X(30).
000016     05  T1-CURRENT-INVENTORY     PIC 9(7).
000017     05  T1-ALLOCATED-STOCK       PIC 9(7).
000018     05  T1-POINT-OF-ORDERING     PIC 9(7).
000019     05  T1-BASE-INVENTORY        PIC 9(7).
000020     05  T1-SUPPLYER-CODE         PIC X(5).
000021 FD 01-OUTPUT-FILE LABEL RECORD OMITTED
000022                          REPORT IS INVENTORY-MASTER-LIST.
000023 WORKING-STORAGE SECTION.
000024 01  FILE-END-FLAG PIC X VALUE '0'.
000025 01  W-DATE           PIC X(8).
000026 REPORT SECTION.
000027 RD  INVENTORY-MASTER-LIST CONTROLS ARE T1-PRODUCT-CODE
000028                PAGE LIMITS 66 LINES
000029                     HEADING 1
000030                     FIRST DETAIL  7
000031                     LAST  DETAIL 56
000032                     FOOTING      66.
000033 01  INVENTORY-MASTER-DETAIL TYPE IS DETAIL.
000034     05  LINE NUMBER IS 4.
000035         10  COLUMN 10 PIC X(12) VALUE  'PRODUCT CODE: '.
000036         10  COLUMN 22 PIC X(6)  SOURCE T1-PRODUCT-CODE.
000037     05  LINE NUMBER IS 5.
000038         10  COLUMN 10 PIC X(8)  VALUE  'PRODUCT NAME: '.
000039         10  COLUMN 18 PIC X(30) SOURCE T1-PRODUCT-NAME.
000040     05  LINE NUMBER IS 6.
000041         10  COLUMN 10 PIC X(10) VALUE  'CURRENT INVENTORY: '.
000042         10  COLUMN 20 PIC 9(7)  SOURCE T1-CURRENT-INVENTORY.
000043     05  LINE NUMBER IS 7.
000044         10  COLUMN 10 PIC X(8)  VALUE  'ALLOCATED STOCK: '.
000045         10  COLUMN 18 PIC 9(7)  SOURCE T1-ALLOCATED-STOCK.
000046     05  LINE NUMBER IS 8.
000047         10  COLUMN 10 PIC X(8)  VALUE  'POINT OF ORDERING: '.
000048         10  COLUMN 18 PIC 9(7)  SOURCE T1-POINT-OF-ORDERING.
000049     05  LINE NUMBER IS 9.
000050         10  COLUMN 10 PIC X(12) VALUE  'BASE INVENTORY: '.
000051         10  COLUMN 22 PIC 9(7)  SOURCE T1-BASE-INVENTORY.
000052     05  LINE NUMBER IS 10.
000053         10  COLUMN 10 PIC X(14) VALUE  'SUPPLYER CODE: '.
000054         10  COLUMN 24 PIC X(5)  SOURCE T1-SUPPLYER-CODE.
000055 01  TYPE IS PAGE HEADING.
000056     05  LINE NUMBER IS 2.
000057         10  COLUMN  41 PIC X(18) VALUE '*** INVENTORY MASTER'.
000058         10  COLUMN  60 PIC X(16) VALUE 'SLIP  ***'.
000059         10  COLUMN  95 PIC X(8)  SOURCE W-DATE.
000060 01  TYPE IS CONTROL FOOTING T1-PRODUCT-CODE
000061     NEXT GROUP NEXT PAGE.
```

(1-25) →

⋮

Fig. 25

(4. RESULT OUTPUTTING PROGRAM —CONTINUED)

```
000062 PROCEDURE DIVISION.
000063 MAIN PROCESS.
000064      OPEN INPUT T1-INVENTORY-MASTER-FILE
000065          OUTPUT 01-OUTPUT-FILE.
000066      MOVE CURRENT-DATE TO W-DATE.
000067      INITIATE INVENTORY-MASTER-LIST.
000068      PERFORM INVENTORY-MASTER-FILE-INPUT.
000069      PERFORM REPORTING-CONTROL
000070        UNTIL (FILE-END-FLAG = '1').
000071      TERMINATE INVENTORY-MASTER-LIST.
000072      CLOSE T1-INVENTORY-MASTER-FILE
000073            01-OUTPUT-FILE.
000074      STOP RUN.
000075*************************************************************
000076 REPORTING CONTROL.
000077      GENERATE INVENTORY-MASTER-DETAIL.
000078      PERFORM  INVENTORY-MASTER-FILE-INPUT.
000079*************************************************************
000080 INVENTORY-MASTER-FILE-INPUT.
000081      READ T1-INVENTORY-MASTER-FILE
000082        AT END MOVE '1' TO FILE-END-FLAG
000083      END-READ.
000084 END PROGRAM INVENTORY-MASTER-CORRECTION—RESULT-OUTPUT.
```

Fig.26

LOCATION NUMBER	COMPOENET TO BE EXTRACTED	LOCATION AFTER TRANSFORMATION	HOW TO FIND FOR EXTRACTION	STRUCTURAL, SYNTAX TRANSFORMATION	REASON FOR THIS EXTRACTION/TRANSFORMATION
ORIGIN OF EXTRACTION: IDENTIFICATION DIVISION					
(1-10)	PROGRAM NAME	CLASS NAME	EXTRACT FROM PARAGRAPH OF PROGRAM-ID		
		FOOTING OF CLASS END	〃		
ORIGIN OF EXTRACTION: ENVIRONMENT DIVISION					
(1-11)	"SELECT" STATEMENT OF OLD MASTER FILE	ENVIRONMENT DIVISION	JUDGE NAME OF OLD MASTER FILE BASED ON NAMING RULE OF FILE, EXTRACT "SELECT" STATEMENT	a. CHANGE "ORGANIZATION" INDICATION TO "INDEXED" ("ORGANIZATION INDEXED") b. APPEND "ACCESS RANDOM" INDICATION c. APPEND "RECORD KEY" INDICATION	
ORIGIN OF EXTRACTION: DATA DIVISION					
(1-13)	OLD MASTER RECORD DEFINITION	CLASS VARIABLE → FILE SECTION	JUDGE NAME OF OLD MASTER FILE BASED ON NAMING RULE		
(1-12)	TRANSACTION RECORD DEFINITION	MATCHING AND UPDATING METHOD → LINKAGE SECTION OF DATA DIVISION	JUDGE NAME OF TRANSACTION FILE BASED ON NAMING RULE		CHANGE FROM "READ" FROM FILE TO PARAMETER TO METHOD
		MATCHING AND UPDATING METHOD → WS SECTION OF DATA DIVISION	〃	INSERT ONLY RECORD NAME	USE TRANSACTION RECORD AS PARAMETER
(1-14)	FLAG ITEM	MATCHING AND UPDATING METHOD → WS SECTION OF DATA DIVISION	EXTRACT DATA OF WS SECTION WITHOUT CHANGE		FLAG ITEM BECOMES NECESSARY, SINCE LOGIC OF MATCHING AND UPDATING PROGRAM (INPUT TRANSACTION RECORD AND MASTER RECORD, COMPARISON OF KEYS) IS USED WITHOUT CHANGE

ORIGIN OF EXTRACTION: DATA DIVISION → AFTER TRANSFORMATION: MATCHING AND UPDATING METHOD, PROCEDURE DIVISION

(1-15)	MAIN PROCESS	PROCEDURE DIVISION OF MATCHING AND UPDATING METHOD	KNOWN BY PREPROCESSING	a. DELETE INDICATION OF TRANSACTION, NEW MASTER FILE FROM "OPEN" AND "CLOSE" STATEMENTS. CHANGE "OPEN" MODE OF OLD MASTER FILE TO "I-O" MODE. b. DELETE REPETITION INDICATION ("UNTIL") FROM "PERFORM" STATEMENT FOR UPDATE CONTROL PROCESS. c. CHANGE "STOP RUN" STATEMENT TO "EXIT METHOD" STATEMENT.	a. INPUT TRANSACTION AS A PARAMETER "READ" AND "WRITE" ARE DONE FROM/TO SAME MASTER FILE. b. PROCESS ONLY ONE RECORD
(1-16)	UPDATE CONTROL	〃	〃	DELETE "PERFORM" STATEMENT WHICH CALLS MASTER PROCESS IF TRANSACTION KEY DOES NOT MATCH MASTER KEY.	MASTER PROCESS (TO PREPARE NEXT MASTER RECORD) BECOMES UNNECESSARY, SINCE ONLY ONE MASTER RECORD IS PROCESSED.
(1-17)	MATCHING	〃	〃	DELETE "PERFORM" STATEMENT FOR TRANSACTION INPUT.	DOES NOT CALL PROCESS FOR PREPARING NEXT TRANSACTION, SINCE ONLY ONE TRANSACTION RECORD IS PROCESSED.
(1-18)	TRANSACTION PROCESS	〃	〃	REPLACE "PERFORM" STATEMENT FOR NEW MASTER OUTPUT BY "PERFORM" STATEMENT FOR ADDITIONAL NEW MASTER OUTPUT PROCESS.	IN BATCH PROCESSING (SEQUENTIAL FILE), UPDATE AND ADDITION ARE PERFORMED BY "WRITE," ON-LINE REAL-TIME PROCESSING (INDEXED FILE), "WRITE" FOR ADDITION OR "REWRITE" FOR UPDATE ARE USED.
(1-19, UPDATE), (1-20, ADDITION) ARE EXTRACTED AND INSERTED WITHOUT CHANGE					
(1-21)	NEW MASTER OUTPUT	〃	〃	CHANGE "WRITE" STATEMENT TO "REWRITE."	THE SAME AS (22)
				CHANGE NAME OF SECTION TO ADDITIONAL NEW MASTER OUTPUT PROCESS	
(1-22)	DELETION	〃	〃	DELETE "PERFORM" STATEMENT FOR OLD MASTER INPUT AND REPLACE BY "DELETE" STATEMENT OF MASTER RECORD	BATCH PROCESSING: INPUT OLD MASTER RECORD → IF DELETE, DON' T OUTPUT TO NEW MASTER (PASS) AND INPUT NEXT MASTER RECORD ↓ ON-LINE REAL-TIME PROCESSING : INPUT MASTER RECORD → IF DELETE, THE RECORD IS DELETED BY "DELETE" STATEMENT.
(1-23)	TRANSACTION INPUT	〃	〃	a. DELETE "READ" STATEMENT b. EXTRACT ONLY "MOVE" STATEMENT THAT MOVES FROM KEY OF TRANSACTION RECORD AND INSERT IT INTO LOCATION AFTER TRANSFORMATION	a. TRANSACTION IS INPUT AS A PARAMETER OF METHOD b. EXTRACT NECESSARY LOGIC PART FOR MATCHING WITH MASTER KEY. THE OTHER PARTS SUCH AS CHECKING END OF FILE ARE UNNECESSARY
(1-24, OLD MASTER INPUT) IS EXTRACTED AND INSERTED WITHOUT CHANGE					

Fig.27

27 /69

Replacement Sheet

Fig.28

LOCATION NUMBER	COMPONENT TO BE EXTRACTED	LOCATION AFTER TRANSFORMATION	HOW TO FIND FOR EXTRACTION	STRUCTURAL, SYNTAX TRANSFORMATION	REASON FOR THIS EXTRACTION/ TRANSFORMATION
(1-9)	PROCEDURE DIVISION DATA ITEM NAME IN "ASCENDING" INDICATION OF "SORT" STATEMENT	ENVIRONMENT DIVISION "SELECT" STATEMENT OF OLD MASTER FILE, RECORD KEY INDICATION	SIMPLE SEARCH	CHANGE AFFIX OF TRANSACTION RECORD TO AFFIX OF OLD MASTER RECORD	

Fig. 29

3. MATCHING AND UPDATING PROGRAM (BEFORE TRANSFORMATION)

```
PROGRAM NAME : ZMUP.CBL
000001 IDENTIFICATION DIVISION.
000002 PROGRAM-ID. INVENTORY-MASTER-CORRECTION-MATCHING-AND-UPDATING.
000003 ENVIRONMENT DIVISION.
000004 INPUT-OUTPUT SECTION.
000005 FILE-CONTROL.
000006     SELECT T1-INVENTORY-MASTER-CORRECTION-FILE
000007            ASSIGN TO SYS010-DA-DK-S
000008            ORGANIZATION LINE SEQUENTIAL.
000009     SELECT M1-INVENTORY-MASTER-FILE
000010            ASSIGN TO SYS030-DA-DK-S
000011            ORGANIZATION LINE SEQUENTIAL.
000012     SELECT M2-INVENTORY-MASTER-FILE
000013            ASSIGN TO SYS031-DA-DK-S
000014            ORGANIZATION LINE SEQUENTIAL.
000015 DATA DIVISION.
000016 FILE SECTION.
000017 FD  T1-INVENTORY-MASTER-CORRECTION-FILE.
000018 01  T1-INVENTORY-MASTER-CORRECTION-RECORD.
000019     05  T1-PROCESSING-CATEGORY     PIC X(1).
000020         88  T1-ADD VALUE '1'.
000021         88  T1-UPDATE VALUE '2'.
000022         88  T1-DELETE VALUE '9'.
000023     05  T1-PRODUCT-CODE            PIC X(6).
000024     05  T1-PRODUCT-NAME            PIC X(30).
000025     05  T1-CURRENT-INVENTORY       PIC 9(7).
000026     05  T1-ALLOCATED-STOCK         PIC 9(7).
000027     05  T1-POINT-OF-ORDERING       PIC 9(7).
000028     05  T1-BASE-INVENTORY          PIC 9(7).
000029     05  T1-SUPPLYER-CODE           PIC X(5).
000030 FD  M1-INVENTORY-MASTER-FILE.
000031 01  M1-INVENTORY-MASTER-RECORD.
000032     05  M1-PRODUCT-CODE            PIC X(6).
000033     05  M1-PRODUCT-NAME            PIC X(30).
000034     05  M1-CURRENT-INVENTORY       PIC 9(7).
000035     05  M1-ALLOCATED-STOCK         PIC 9(7).
000036     05  M1-POINT-OF-ORDERING       PIC 9(7).
000037     05  M1-BASE-INVENTORY          PIC 9(7).
000038     05  M1-SUPPLYER-CODE           PIC X(5).
000039 FD  M2-INVENTORY-MASTER-FILE.
000040 01  M2-INVENTORY-MASTER-RECORD.
000041     05  M2-PRODUCT-CODE            PIC X(6).
000042     05  M2-PRODUCT-NAME            PIC X(30).
000043     05  M2-CURRENT-INVENTORY       PIC 9(7).
000044     05  M2-ALLOCATED-STOCK         PIC 9(7).
000045     05  M2-POINT-OF-ORDERING       PIC 9(7).
000046     05  M2-BASE-INVENTORY          PIC 9(7).
000047     05  M2-SUPPLYER-CODE           PIC X(5).
```

(1-10) →

(1-11) →

(1-12) →

(1-13) →

⋮

Fig.30

(3. MATCHING AND UPDATING PROGRAM —CONTINUED (1))

```
000048
000049 WORKING-STORAGE SECTION.
000050 01  WORKING AREA.                                          (1-14) →
000051     05  W-TRANSACTION-KEY PIC X(6) VALUE LOW-VALUE.
000052     05  W-MASTER-KEY PIC X(6).
000053 01  FLAG.
000054     05  FILE-END-FLAG 1  PIC X VALUE '0'.
000055     05  FILE-END-FLAG 2  PIC X VALUE '0'.
000056     05  PROCESS-END-FLAG PIC X VALUE '0'.
000057
000058 PROCEDURE DIVISION.                                        (1-15) →
000059 MAIN PROCESS.
000060     OPEN INPUT T1-INVENTORY-MASTER-CORRECTION-FILE
000061                M1-INVENTORY-MASTER-FILE
000062         OUTPUT M2-INVENTORY-MASTER-FILE.
000063     PERFORM INVENTORY-MASTER-CORRECTION-INPUT.
000064     PERFORM OLD-INVENTORY-MASTER-INPUT.
000065     PERFORM UPDATE-CONTROL
000066             UNTIL (PROCESS-END-FLAG = '1').
000067     CLOSE T1-INVENTORY-MASTER-CORRECTION-FILE
000068           M1-INVENTORY-MASTER-FILE
000069           M2-INVENTORY-MASTER-FILE.
000070     STOP RUN.
000071*****************************************************************
000072 UPDATE-CONTROL.                                            (1-16) →
000073     IF (W-TRANSACTION-KEY = W-MASTER-KEY)
000074         THEN
000075             PERFORM MATCHING-PROCESS
000076         ELSE
000077             IF (W-TRANSACTION-KEY > W-MASTER-KEY)
000078                 THEN
000079                     PERFORM MASTER-PROCESS
000080                 ELSE
000081                     PERFORM TRANSACTION-PROCESS
000082             END-IF
000083     END-IF.
000084*****************************************************************
000085 MATCHING-PROCESS.                                          (1-17) →
000086     IF (W-TRANSACTION-KEY = HIGH-VALUE)
000087         THEN
000088             MOVE '1' TO PROCESS-END-FLAG
000089         ELSE
000090             EVALUATE T1-PROCESSING-CATEGORY
000091                 WHEN T1-UPDATE
000092                     PERFORM UPDATE-PROCESS
000093                     PERFORM NEW-INVENTORY-MASTER-OUTPUT
000094                     PERFORM OLD-INVENTORY-MASTER-INPUT
000095                 WHEN T1-DELETE
000096                     PERFORM DELETE-PROCESS
000097             END-EVALUATE
000098             PERFORM INVENTORY-MASTER-CORRECTION—INPUT-CHECKING
000099     END-IF.
000100*****************************************************************
                                    ⋮
```

Fig. 31

(3. MATCHING AND UPDATING PROGRAM --CONTINUED (2))

```
000101 MASTER-PROCESS.
000102     MOVE M1-INVENTORY-MASTER-RECORD
000103       TO M2-INVENTORY-MASTER-RECORD.
000104     PERFORM NEW-INVENTORY-MASTER-OUTPUT.
000105     PERFORM OLD-INVENTORY-MASTER-INPUT.
000106*************************************************************************
000107 TRANSACTION-PROCESS.                                                    (1-18) →
000108     IF T1-ADD
000109        THEN
000110            PERFORM ADD-PROCESS
000111            PERFORM NEW-INVENTORY-MASTER-OUTPUT.
000112     END-IF.
000113     PERFORM INVENTORY-MASTER-CORRECTION-INPUT.
000114*************************************************************************
000115 UPDATE-PROCESS.                                                         (1-19) →
000116     MOVE T1-PRODUCT-NAME          TO M2-PRODUCT-NAME.
000117     MOVE T1-CURRENT-INVENTORY     TO M2-CURRENT-INVENTORY.
000118     MOVE T1-ALLOCATED-STOCK       TO M2-ALLOCATED-STOCK.
000119     MOVE T1-POINT-OF-ORDERING     TO M2-POINT-OF-ORDERING.
000120     MOVE T1-BASE-INVENTORY        TO M2-BASE-INVENTORY.
000121     MOVE T1-SUPPLYER-CODE         TO M2-SUPPLYER-CODE.
000122*************************************************************************
000123 ADD-PROCESS.                                                            (1-20) →
000124     MOVE T1-PRODUCT-CODE          TO M2-PRODUCT-CODE.
000125     MOVE T1-PRODUCT-NAME          TO M2-PRODUCT-NAME.
000126     MOVE T1-CURRENT-INVENTORY     TO M2-CURRENT-INVENTORY.
000127     MOVE T1-ALLOCATED-STOCK       TO M2-ALLOCATED-STOCK.
000128     MOVE T1-POINT-OF-ORDERING     TO M2-POINT-OF-ORDERING.
000129     MOVE T1-BASE-INVENTORY        TO M2-BASE-INVENTORY.
000130     MOVE T1-SUPPLYER-CODE         TO M2-SUPPLYER-CODE.
000131*************************************************************************
000132 NEW-INVENTORY-MASTER-OUTPUT.                                            (1-21) →
000133     WRITE M2-INVENTORY-MASTER-RECORD
000134         INVALID MOVE '1' TO PROCESS-END-FLAG.
000135*************************************************************************
000136 DELETE-PROCESS.                                                         (1-22) →
000137     PERFORM OLD-INVENTORY-MASTER-INPUT.
000138*************************************************************************
000139 INVENTORY-MASTER-CORRECTION-INPUT.                                      (1-23) →
000140     READ T1-INVENTORY-MASTER-CORRECTION-FILE
000141         AT END MOVE '1' TO FILE-END-FLAG 1
000142     END-READ.
000143     IF (FILE-END-FLAG 1 = '1')
000144         THEN
000145             MOVE HIGH-VALUE TO W-TRANSACTION-KEY
000146         ELSE
000147             MOVE T1-PRODUCT-CODE
000148               TO W-TRANSACTION-KEY
000149     END-IF.
000150*************************************************************************
000151 OLD-INVENTORY-MASTER-INPUT.                                             (1-24) →
000152     READ M1-INVENTORY-MASTER-FILE
000153         AT END MOVE '1' TO FILE-END-FLAG 2
000154     END-READ.
000155     IF (FILE-END-FLAG 2 = '1')
000156         THEN
000157             MOVE HIGH-VALUE TO W-MASTER-KEY
000158         ELSE
000159             MOVE M1-PRODUCT-CODE TO W-MASTER-KEY
000160     END-IF.
000161 END PROGRAM INVENTORY-MASTER-CORRECTION-MATCHING-AND-UPDATING.
```

Fig.32

2. SORT PROGRAM (BEFORE TRANSFORMATION)

FILE NAME : ZMSR.CBL

```
000001 IDENTIFICATION DIVISION.
000002 PROGRAM-ID. INVENTORY-MASTER-CORRECTION－SORT.
000003 ENVIRONMENT DIVISION.
000004 INPUT-OUTPUT SECTION.
000005 FILE-CONTROL.
000006     SELECT T1-INVENTORY-MASTER-CORRECTION-FILE
000007            ASSIGN TO SYS010-UT-MT-S.
000008     SELECT O1-INVENTORY-MASTER-CORRECTION-FILE
000009            ASSIGN TO SYS020-DA-DK-S.
000010     SELECT S1-INTERMEDIATE-FILE
000011            ASSIGN TO WORK001.
000012 DATA DIVISION.
000013 FILE SECTION.
000014 FD  T1-INVENTORY-MASTER-CORRECTION-FILE.
000015 01  PIC X(70)
000016 FD  O1-INVENTORY-MASTER-CORRECTION-FILE.
000017 01  PIC X(70).
000018 SD  S1-INTERMEDIATE-FILE.
000019 01  S1-INTERMEDIATE-FILE-RECORD.
000020     05  S1-PROCESSING-CATEGORY     PIC X(1).
000021     05  S1-PRODUCT-CODE            PIC X(6).
000022     05  S1-PRODUCT-NAME            PIC X(30).
000023     05  S1-CURRENT-INVENTORY       PIC 9(7).
000024     05  S1-ALLOCATED-STOCK         PIC 9(7).
000025     05  S1-POINT-OF-ORDERING       PIC 9(7).
000026     05  S1-BASE-INVENTORY          PIC 9(7).
000027     05  S1-SUPPLYER-CODE           PIC X(5).
000028 PROCEDURE DIVISION.
000029     SORT INTERMEDIATE-FILE                                  (1-9) →
000030          ON ASCENDING KEY S1-PRODUCT-CODE
000031          USING T1-INVENTORY-MASTER-CORRECTION-FILE
000032          GIVING O1-INVENTORY-MASTER-CORRECTION-FILE.
000033     STOP RUN.
000034 END PROGRAM INVENTORY-MASTER-CORRECTION－SORT.
```

Fig.33

6. FILE CLASS (INTERMEDIATE PROGRAM)

```
FILE NAME : ZMFL.CBL
000001 IDENTIFICATION DIVISION.                                          ← (1-10)
000002 CLASS-ID. INVENTORY-MASTER-CORRECTION-FILE INHERITS CBL-BASE.      (2-10) →
000003 ENVIRONMENT DIVISION.
000004 CONFIGURATION SECTION. .
000005 REPOSITORY.
000006     CLASS CBL-BASE.
000007 INPUT-OUTPUT SECTION.
000008 FILE-CONTROL.
000009     SELECT M1-INVENTORY-MASTER-FILE        ← (1-11)
000010            ASSIGN TO SYS030-DA-DK-I        ← (1-9)
000011            ORGANIZATION INDEXED
000012            ACCESS RANDOM                   (2-11) →
000013            RECORD KEY M1-PRODUCT-CODE.
000014
000015 IDENTIFICATION DIVISION.
000016 CLASS-OBJECT.
000017 DATA DIVISION.
000018*****************************************************************************
000019* CLASS VARIABLE
000020*****************************************************************************
000021 FILE SECTION.
000022 FD  M1-INVENTORY-MASTER-FILE.                                    ← (1-13)
000023 01  M1-INVENTORY-MASTER-RECORD.
000024     05  M1-PRODUCT-CODE          PIC X(6).                       (2-12) →
000025     05  M1-PRODUCT-NAME          PIC X(30).
000026     05  M1-CURRENT-INVENTORY     PIC S9(7).
000027     05  M1-ALLOCATED-STOCK       PIC S9(7).
000028     05  M1-POINT-OF-ORDERING     PIC S9(7).
000029     05  M1-BASE-INVENTORY        PIC S9(7).
000030     05  M1-SUPPLYER-CODE         PIC X(5).
000031
000032 PROCEDURE DIVISION.
000033*****************************************************************************
000034* CLASS METHOD
000035*****************************************************************************
000036 IDENTIFICATION DIVISION.
000037 METHOD-ID. 'updateRecord'.
000038*****************************************************************************                    (2-14) →
000039 DATA DIVISION.
000040 LINKAGE SECTION.
000041 01  T1-INVENTORY-MASTER-CORRECTION-RECORD.                  ← (1-12)
000042     05  T1-PROCESSING-CATEGORY    PIC X(1).                 (2-13) →
000043         88  T1-ADD VALUE '1'.
000044         88  T1-UPDATE VALUE '2'.
000045         88  T1-DELETE VALUE '9'.
000046     05  T1-PRODUCT-CODE           PIC X(6).
000047     05  T1-PRODUCT-NAME           PIC X(30).
000048     05  T1-CURRENT-INVENTORY      PIC 9(7).
000049     05  T1-ALLOCATED-STOCK        PIC 9(7).
000050     05  T1-POINT-OF-ORDERING      PIC 9(7).
000051     05  T1-BASE-INVENTORY         PIC 9(7).
000052     05  T1-SUPPLYER-CODE          PIC X(5).
000053
000054 WORKING-STORAGE SECTION.                                          ← (1-14)
000055 01  WORKING AREA.
000056     05  W-TRANSACTION-KEY PIC X(6) VALUE LOW-VALUE.
000057     05  W-MASTER-KEY PIC X(6).
000058 01  FLAG.
000059     05  FILE-END-FLAG1 PIC X VALUE '0'.
000060     05  FILE-END-FLAG2 PIC X VALUE '0'.
000061     05  PROCESS-END-FLAG PIC X VALUE '0'.
000062
000063 PROCEDURE DIVISION USING T1-INVENTORY-MASTER-CORRECTION-RECORD.   ← (1-12)
000064 MAIN PROCESS.                                                     ← (1-15)
000065     OPEN I-O M1-INVENTORY-MASTER-FILE.
000066     PERFORM INVENTORY-MASTER-CORRECTION-INPUT.
000067     PERFORM OLD-INVENTORY-MASTER-INPUT.
000068     PERFORM UPDATE-CONTROL.
000069     CLOSE M1-INVENTORY-MASTER-FILE.
000070     EXIT METHOD.
```

⋮

Fig.34

(6. FILE CLASS --CONTINUED)

```
000071*****************************************************************
000072 UPDATE-CONTROL.                                                  <- (1-16)
000073     IF (W-TRANSACTION-KEY = W-MASTER-KEY)
000074         THEN
000075             PERFORM MATCHING
000076         ELSE
000077             PERFORM TRANSACTION
000078     END-IF.
000079*****************************************************************
000080 MATCHING.                                                        <- (1-17)
000081     IF (W-TRANSACTION-KEY = HIGH-VALUE)
000082         THEN
000083             MOVE '1' TO PROCESS-END-FLAG
000084         ELSE
000085             EVALUATE TI-PROCESSING-CATEGORY
000086                 WHEN TI-UPDATE
000087                     PERFORM UPDATE-PROCESS
000088                     PERFORM NEW-INVENTORY-MASTER-OUTPUT
000089                 WHEN TI-DELETE
000090                     PERFORM DELETE-PROCESS
000091             END-EVALUATE
000092     END-IF.
000093*****************************************************************
000094 TRANSACTION.                                                     <- (1-18)
000095     IF TI-ADD
000096        THEN
000097            PERFORM ADD-PROCESS
000098            PERFORM ADDNEW-INVENTORY-MASTER-OUTPUT.
000099     END-IF.
000100*****************************************************************

000101 UPDATE-PROCESS.                                                  <- (1-19)
000102     MOVE TI-PRODUCT-NAME          TO MI-PRODUCT-NAME.
000103     MOVE TI-CURRENT-INVENTORY     TO MI-CURRENT-INVENTORY.
000104     MOVE TI-ALLOCATED-STOCK       TO MI-ALLOCATED-STOCK.
000105     MOVE TI-POINT-OF-ORDERING     TO MI-POINT-OF-ORDERING.
000106     MOVE TI-BASE-INVENTORY        TO MI-BASE-INVENTORY.
000107     MOVE TI-SUPPLYER-CODE         TO MI-SUPPLYER-CODE.
000108*****************************************************************
000109 ADD-PROCESS.                                                     <- (1-20)
000110     MOVE TI-PRODUCT-CODE          TO MI-PRODUCT-CODE.
000111     MOVE TI-PRODUCT-NAME          TO MI-PRODUCT-NAME.
000112     MOVE TI-CURRENT-INVENTORY     TO MI-CURRENT-INVENTORY.
000113     MOVE TI-ALLOCATED-STOCK       TO MI-ALLOCATED-STOCK.
000114     MOVE TI-POINT-OF-ORDERING     TO MI-POINT-OF-ORDERING.
000115     MOVE TI-BASE-INVENTORY        TO MI-BASE-INVENTORY.
000116     MOVE TI-SUPPLYER-CODE         TO MI-SUPPLYER-CODE.
000117*****************************************************************
000118 ADD-NEW-INVENTORY-MASTER-OUTPUT.                                 <- (1-21)
000119     WRITE MI-INVENTORY-MASTER-RECORD
000120         INVALID MOVE '1' TO PROCESS-END-FLAG.
000121*****************************************************************
000122 NEW-INVENTORY-MASTER-OUTPUT.                                     <- (1-21)
000123     REWRITE MI-INVENTORY-MASTER-RECORD
000124         INVALID MOVE '1' TO PROCESS-END-FLAG.
000125*****************************************************************
000126 DELETE-PROCESS.                                                  <- (1-22)
000127     DELETE MI-INVENTORY-MASTER-RECORD
000128         INVALID MOVE '1' TO PROCESS-END-FLAG.
000129*****************************************************************
000130 INVENTORY-MASTER-CORRECTION-INPUT.                               <- (1-23)
000131     MOVE TI-PRODUCT-CODE
000132       TO W-TRANSACTION-KEY MI-PRODUCT-CODE
000133*****************************************************************
000134 OLD-INVENTORY-MASTER-INPUT.                                      <- (1-24)
000135     READ MI-INVENTORY-MASTER-FILE
000136          INVALID MOVE '1' TO FILE-END-FLAG2 .
000137     IF (FILE-END-FLAG2 = '1')
000138         THEN
000139             MOVE HIGH-VALUE TO W-MASTER-KEY
000140         ELSE
000141             MOVE MI-PRODUCT-CODE TO W-MASTER-KEY
000142     END-IF.
000143 END METHOD 'updateRecord'.
000144 END CLASS-OBJECT.
000145 END CLASS INVENTORY-MASTER-CORRECTION-FILE.                      <- (1-10)
```

(2-14 -CONTINUED) →

Fig.35

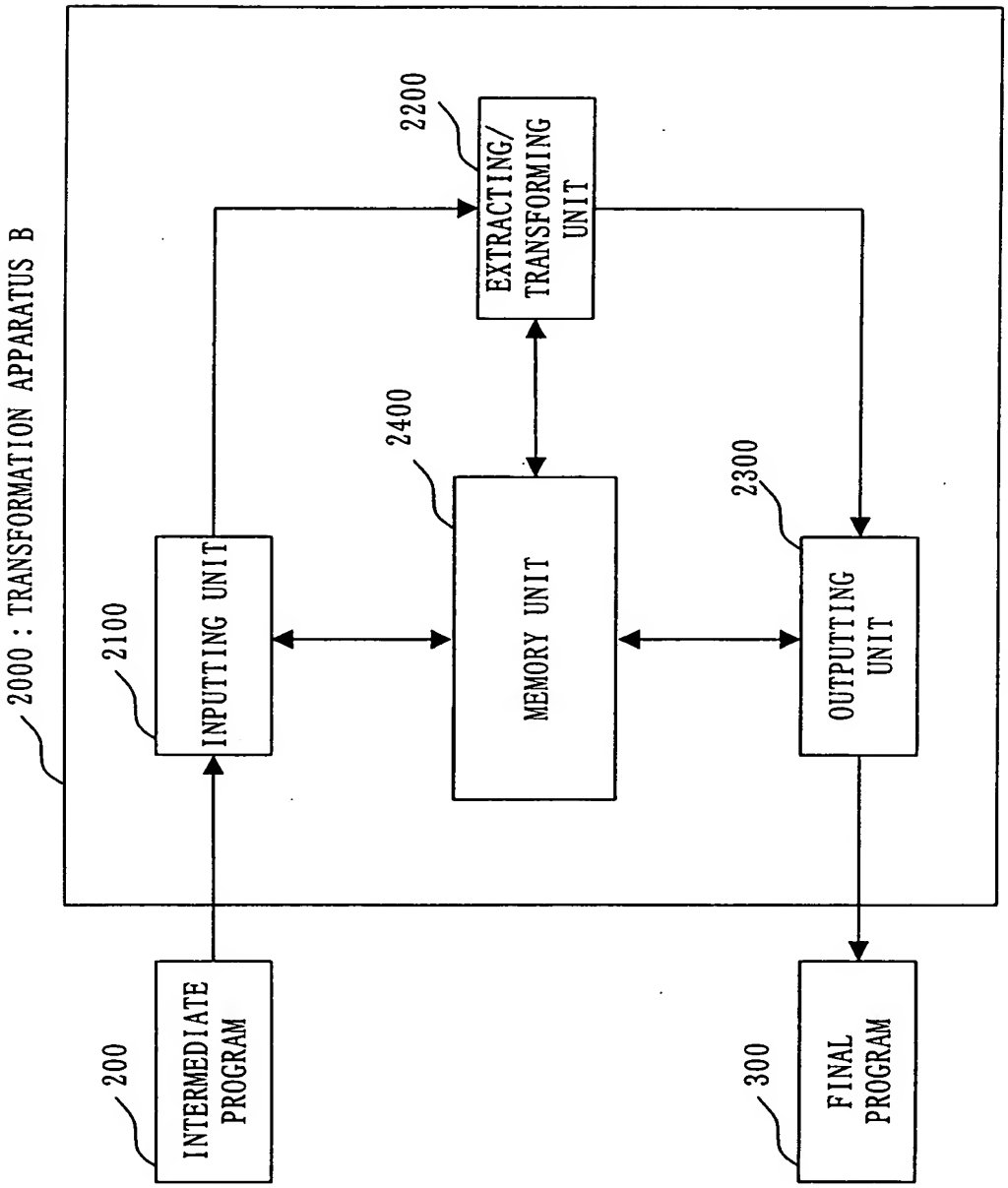

2000 : TRANSFORMATION APPARATUS B
2200
EXTRACTING/ TRANSFORMING UNIT
2400
MEMORY UNIT
2300
OUTPUTTING UNIT
2100
INPUTTING UNIT
200
INTERMEDIATE PROGRAM
300
FINAL PROGRAM

Fig.36

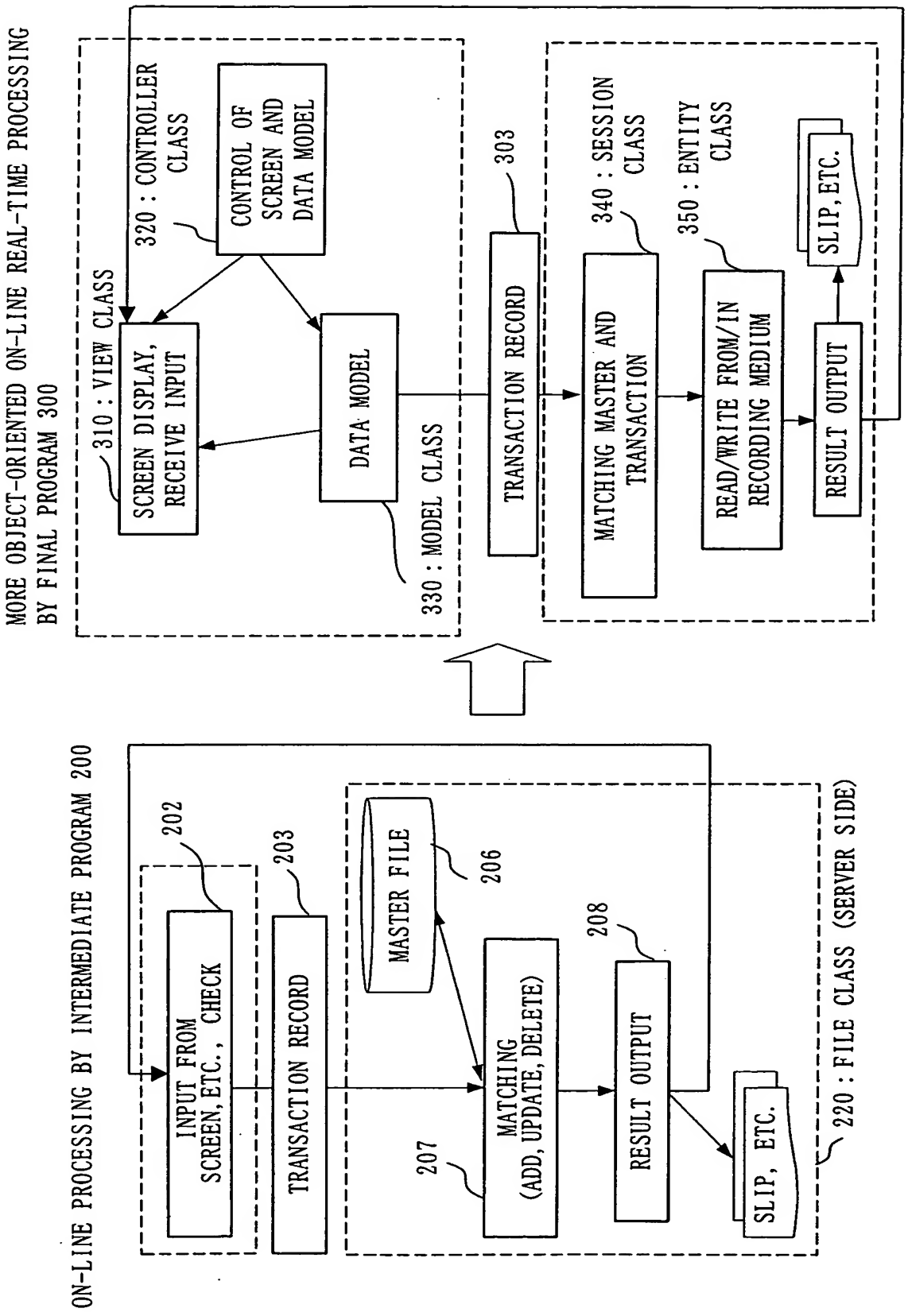

MORE OBJECT-ORIENTED ON-LINE REAL-TIME PROCESSING BY FINAL PROGRAM 300
310 : VIEW CLASS
SCREEN DISPLAY, RECEIVE INPUT
320 : CONTROLLER CLASS
CONTROL OF SCREEN AND DATA MODEL
330 : MODEL CLASS
DATA MODEL
303
TRANSACTION RECORD
340 : SESSION CLASS
MATCHING MASTER AND TRANSACTION
350 : ENTITY CLASS
READ/WRITE FROM/IN RECORDING MEDIUM
RESULT OUTPUT
SLIP, ETC.
ON-LINE PROCESSING BY INTERMEDIATE PROGRAM 200
202
INPUT FROM SCREEN, ETC., CHECK
203
TRANSACTION RECORD
MASTER FILE
206
207
MATCHING (ADD, UPDATE, DELETE)
208
RESULT OUTPUT
SLIP, ETC.
220 : FILE CLASS (SERVER SIDE)

Fig.37

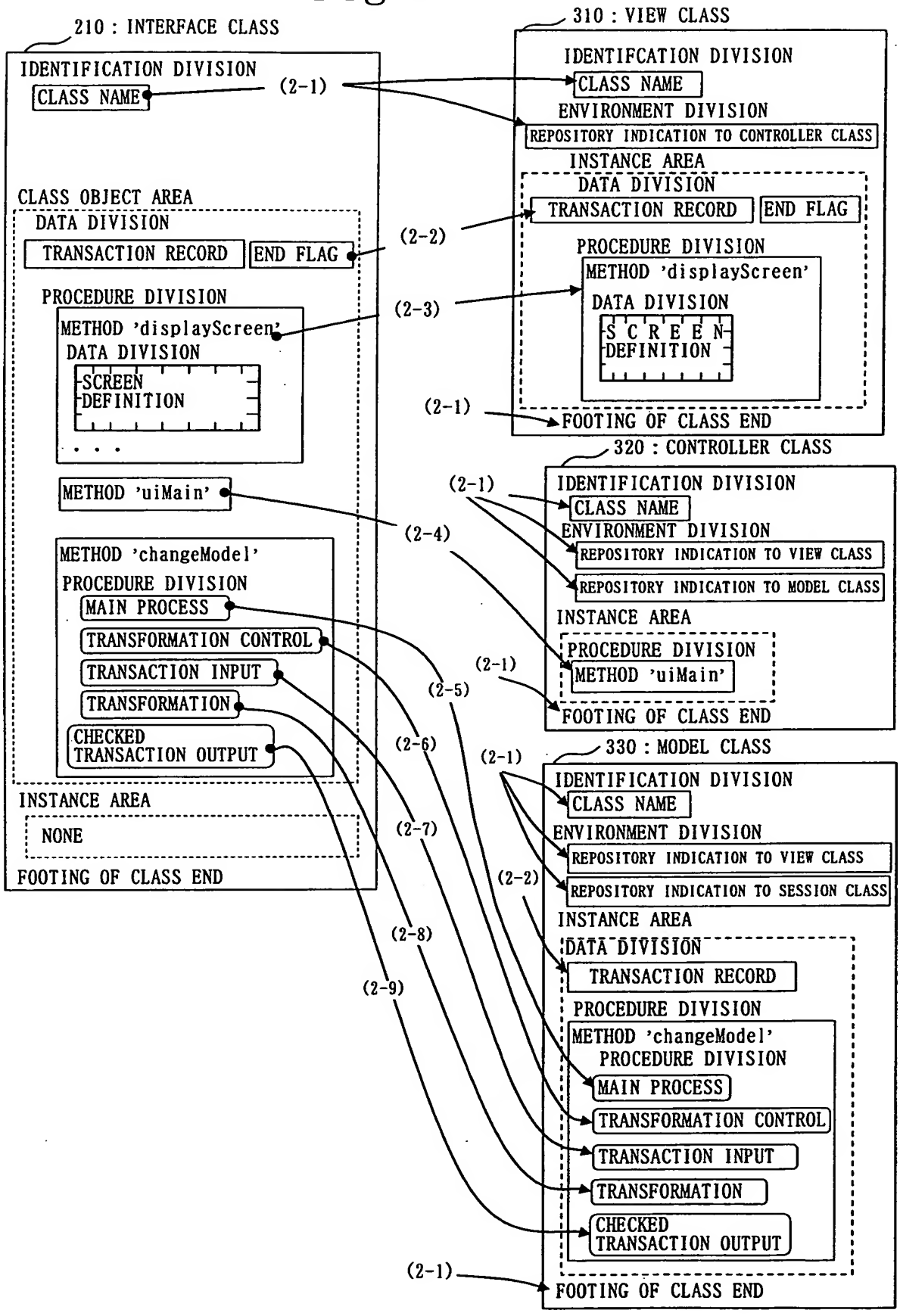

210 : INTERFACE CLASS
IDENTIFICATION DIVISION
CLASS NAME
(2-1)
CLASS OBJECT AREA
DATA DIVISION
TRANSACTION RECORD
END FLAG
PROCEDURE DIVISION
METHOD 'displayScreen'
DATA DIVISION
SCREEN DEFINITION
. . .
METHOD 'uiMain'
METHOD 'changeModel'
PROCEDURE DIVISION
MAIN PROCESS
TRANSFORMATION CONTROL
TRANSACTION INPUT
TRANSFORMATION
CHECKED TRANSACTION OUTPUT
INSTANCE AREA
NONE
FOOTING OF CLASS END
310 : VIEW CLASS
IDENTIFCATION DIVISION
CLASS NAME
ENVIRONMENT DIVISION
REPOSITORY INDICATION TO CONTROLLER CLASS
INSTANCE AREA
DATA DIVISION
TRANSACTION RECORD
END FLAG
PROCEDURE DIVISION
METHOD 'displayScreen'
DATA DIVISION
SCREEN DEFINITION
(2-2)
(2-3)
(2-1)
FOOTING OF CLASS END
320 : CONTROLLER CLASS
IDENTIFICATION DIVISION
CLASS NAME
ENVIRONMENT DIVISION
REPOSITORY INDICATION TO VIEW CLASS
REPOSITORY INDICATION TO MODEL CLASS
INSTANCE AREA
PROCEDURE DIVISION
METHOD 'uiMain'
FOOTING OF CLASS END
(2-4)
(2-5)
(2-6)
(2-7)
(2-8)
(2-9)
330 : MODEL CLASS
IDENTIFICATION DIVISION
CLASS NAME
ENVIRONMENT DIVISION
REPOSITORY INDICATION TO VIEW CLASS
REPOSITORY INDICATION TO SESSION CLASS
INSTANCE AREA
DATA DIVISION
TRANSACTION RECORD
PROCEDURE DIVISION
METHOD 'changeModel'
PROCEDURE DIVISION
MAIN PROCESS
TRANSFORMATION CONTROL
TRANSACTION INPUT
TRANSFORMATION
CHECKED TRANSACTION OUTPUT
FOOTING OF CLASS END

Fig.38

NUMBER	COMPONENT TO BE EXTRACTED	LOCATION AFTER TRANSFORMATION	STRUCTURAL, SYNTAX TRANSFORMATION	REASON FOR THIS EXTRACTION/TRANSFORMATION
ORIGIN OF EXTRACTION: UI, CLASS IDENTIFICATION DIVISION				
(2-1)	CLASS NAME	CLASS NAME	APPEND AFFIX OF VIEW CLASS	
		ENVIRONMENT DIVISION INTERNAL NAME FOR REPOSITORY INDICATION FOR CONTROLLER CLASS	· APPEND AFFIX OF CONTROLLER CLASS NAME · FOR EXTERNAL NAME, INSERT FILE NAME OF CONTROLLER CLASS ACCORDING TO NAMING RULE	
		FOOTING OF CLASS END	APPEND AFFIX OF VIEW CLASS	
ORIGIN OF EXTRACTION: UI, CLASS VARIABLE				
(2-2)	TRANSACTION RECORD AND END FLAG	INSTANCE VARIABLE → WS SECTION	APPEND "PROPERTY" INDICATION TO DATA ITEM	INPUT FROM SCREEN IS STORED IN A FORMAT OF RECORD APPEND "PROPERTY" INDICATION FOR LATER REFERENCE FROM MODEL CLASS
ORIGIN OF EXTRACTION: UI, CLASS METHOD				
(2-3)	SCREEN DISPLAYING METHOD	INSTANCE METHOD		

Fig.39

NUMBER	COMPOENET TO BE EXTRACTED	LOCATION AFTER TRANSFORMATION	STRUCTURAL, SYNTAX TRANSFORMATION	REASON FOR THIS EXTRACTION/ TRANSFORMATION
ORIGIN OF EXTRACTION: UI, CLASS IDENTIFICATION DIVISION				
(2-1)	CLASS NAME	CLASS NAME	APPEND AFFIX OF CONTROLLER CLASS	
		ENVIRONMENT DIVISION INTERNAL NAME FOR REPOSITORY INDICATION FOR VIEW CLASS	· APPEND AFFIX OF VIEW CLASS · FOR EXTERNAL NAME, INSERT FILE NAME OF VIEW CLASS ACCORDING TO NAMING RULE	
		INTERNAL NAME FOR REPOSITORY INDICATION FOR MODEL CLASS	· APPEND AFFIX OF MODEL CLASS · FOR EXTERNAL NAME, INSERT FILE NAME OF MODEL CLASS ACCORDING TO NAMING RULE	
		FOOTING OF CLASS END	APPEND AFFIX OF CONTROLLER CLASS	
ORIGIN OF EXTRACTION: UI, CLASS VARIABLE				
(2-4)	UI MAIN METHOD → PROCEDURE DIVISION	INSTANCE METHOD → MAIN METHOD → PROCEDURE DIVISION	a. " INVOKE" STATEMENT TO SCREEN DISPLAYING METHOD CLASS INDICATION TO BE CALLED: CHANGE TO NAME OF REFERENCE ITEM TO VIEW CLASS b. " INVOKE" STATEMENT TO CHECKING METHOD CLASS INDICATION TO BE CALLED: CHANGE TO NAME OF REFERENCE ITEM TO MODEL CLASS	CHANGE CALLING, SINCE SCREEN DISPLAYING METHOD IS ASSIGNED TO VIEW CLASS AND CHECKING METHOD IS ASSIGNED TO INSTANCE OF MODEL CLASS

NUMBER	COMPONENT TO BE EXTRACTED	LOCATION AFTER TRANSFORMATION	STRUCTURAL, SYNTAX TRANSFORMATION	REASON FOR THIS EXTRACTION/ TRANSFORMATION
ORIGIN OF EXTRACTION: UI, CLASS IDENTIFICATION DIVISION				
(2-1)	CLASS NAME	CLASS NAME	APPEND AFFIX MODEL CLASS	
		ENVIRONMENT DIVISION INTERNAL NAME FOR REPOSITORY INDICATION FOR VIEW CLASS	· APPEND AFFIX OF VIEW CLASS · FOR EXTERNAL NAME, INSERT FILE NAME OF VIEW CLASS ACCORDING TO NAMING RULE	
		INTERNAL NAME FOR REPOSITORY INDICATION FOR SESSION CLASS	· APPEND AFFIX OF SESSION CLASS · FOR EXTERNAL NAME, INSERT FILE NAME OF SESSION CLASS ACCORDING TO NAMING RULE	
		FOOTING OF CLASS END	APPEND AFFIX OF MODEL CLASS	
ORIGIN OF EXTRACTION: UI, CLASS VARIABLE				
(2-2)	TRANSACTION RECORD	INSTANCE VARIABLE		
ORIGIN OF EXTRACTION: UI, CLASS METHOD, MATCHING AND UPDATING METHOD → AFTER TRANSFORMATION: MODEL, INSTANCE METHOD, MATCHING AND UPDATING METHOD				
(2-5, MAIN PROCESS), (2-6, TRANSFORMATION CONTROL), (2-8, TRANSFORMATION) ARE EXTRACTED AND INSERTED WITHOUT CHANGE				
(2-7)	TRANSACTION INPUT		"INVOKE" STATEMENT TO VIEW DATA OBTAINING METHOD IN VIEW CLASS	MODEL CLASS RECEIVES INPUT DATA FROM VIEW CLASS AND CHECK DATA
(2-9)	CHECKED TRANSACTION OUTPUT		a. CREATE "INVOKE" STATEMENT TO INITIALIZATION METHOD IN SESSION CLASS, b. "INVOKE" STATEMENT TO TRANSACTION CHECKING METHOD IN SESSION CLASS,	TRANSFER CHECKED TRANSACTION TO SESSION CLASS.

Fig.40

40 /69

Replacement Sheet

Fig.41

7. VIEW CLASS (FINAL PROGRAM)

FILE NAME : ZMVI.CBL

```
000001 IDENTIFICATION DIVISION.                                          ← (2-1)
000002 CLASS-ID. INVENTORY-MASTER-CORRECTION-view INHERITS CBL-BASE.
000003 ENVIRONMENT DIVISION.
000004 CONFIGURATION SECTION.
000005 REPOSITORY.
000006     CLASS CBL-BASE.                                               ← (2-1)
000007     CLASS INVENTORY-MASTER-CORRECTION-controller IS 'ZMCN'.
000008
000009 IDENTIFICATION DIVISION.
000010 CLASS-OBJECT.
000011 PROCEDURE DIVISION.
000012*************************************************************************
000013* CLASS METHOD
000014*************************************************************************
000015 IDENTIFICATION DIVISION.
000016 METHOD-ID. 'create'.
000017*************************************************************************
000018 DATA DIVISION.
000019 WORKING-STORAGE SECTION.
000020 01  W-INVENTORY-MASTER-CORRECTION-view OBJECT REFERENCE SELF.
000021 PROCEDURE DIVISION.
000022     INVOKE SELF 'CBL-NEW'
000023           RETURNING W-INVENTORY-MASTER-CORRECTION-view.
000024     INVOKE INVENTORY-MASTER-CORRECTION-controller 'create'
000025           USING W-INVENTORY-MASTER-CORRECTION-view.
000026     EXIT METHOD.
000027 END METHOD 'create'.
000028 END CLASS-OBJECT.
000029
000030 IDENTIFICATION DIVISION.
000031 OBJECT.
000032 DATA DIVISION.
000033*************************************************************************
000034* INSTANCE VARIABLE
000035*************************************************************************
000036 WORKING-STORAGE SECTION.
000037 01  T1-INVENTORY-MASTER-CORRECTION-RECORD.                          ← (2-2)
000038     05  T1-PROCESSING-CATEGORY     PIC X(1) PROPERTY NO SET.
000039     05  T1-PRODUCT-CODE            PIC X(6) PROPERTY NO SET.
000040     05  T1-PRODUCT-NAME            PIC X(30) PROPERTY NO SET.
000041     05  T1-CURRENT-INVENTORY       PIC 9(7) PROPERTY NO SET.
000042     05  T1-ALLOCATED-STOCK         PIC 9(7) PROPERTY NO SET.
000043     05  T1-POINT-OF-ORDERING       PIC 9(7) PROPERTY NO SET.
000044     05  T1-BASE-INVENTORY          PIC 9(7) PROPERTY NO SET.
000045     05  T1-SUPPLYER-CODE           PIC X(5) PROPERTY NO SET.
000046 01  END FLAG PIC X(1) PROPERTY NO SET.
```

⋮

Fig.42

(7. VIEW CLASS --CONTINUED)

```
000047 PROCEDURE DIVISION.
000048*****************************************************************************
000049* INSTANCE METHOD
000050*****************************************************************************
000051 IDENTIFICATION DIVISION.
000052 METHOD-ID. 'displayScreen'.
000053*****************************************************************************
000054 DATA DIVISION.                                                          ← (2-3)
000055 SCREEN SECTION.
000056 01  INVENTORY MASTER DETAIL.
000057     05  LINE  3 COLUMN 10 VALUE 'PROCESSING CATEGORY    : _'.
000058     05  LINE  3 COLUMN 24 PIC X(1) TO T1-PROCESSING-CATEGORY.
000059     05  LINE  4 COLUMN 10 VALUE 'PRODUCT CODE  : ______'.
000060     05  LINE  4 COLUMN 24 PIC X(6) TO T1-PRODUCT-CODE.
000061     05  LINE  5 COLUMN 10 VALUE 'PRODUCT NAME      : ______________________________'.
000062     05  LINE  5 COLUMN 24 PIC X(30) TO T1-PRODUCT-NAME.
000063     05  LINE  6 COLUMN 10 VALUE 'CURRENT INVENTORY    : _______'.
000064     05  LINE  6 COLUMN 24 PIC 9(7) TO T1-CURRENT-INVENTORY.
000065     05  LINE  7 COLUMN 10 VALUE 'ALLOCATED STOCK      : _______'.
000066     05  LINE  7 COLUMN 24 PIC 9(7) TO T1-ALLOCATED-STOCK.
000067     05  LINE  8 COLUMN 10 VALUE 'POINT OF ORDERING    : _______'.
000068     05  LINE  8 COLUMN 24 PIC 9(7) TO T1-POINT-OF-ORDERING.
000069     05  LINE  9 COLUMN 10 VALUE 'BASE INVENTORY  : _______'.
000070     05  LINE  9 COLUMN 24 PIC 9(7) TO T1-BASE-INVENTORY.
000071     05  LINE 10 COLUMN 10 VALUE 'SUPPLYER CODE: _____'.
000072     05  LINE 10 COLUMN 24 PIC X(5) TO T1-SUPPLYER-CODE.
000073     05  LINE 11 COLUMN 40 VALUE 'END        : _'.
000074     05  LINE 11 COLUMN 24 PIC X(1) TO END-FLAG.
000075 PROCEDURE DIVISION.
000076     DISPLAY INVENTORY-MASTER-FILE-DETAIL.
000077     ACCEPT  INVENTORY-MASTER-FILE-DETAIL.
000078     EXIT METHOD.
000079 END METHOD. 'displayScreen'.
000080 END OBJECT.
000081 END CLASS INVENTORY-MASTER-CORRECTION-view.   ← (2-1)
```

Fig.43

8. CONTROLLER CLASS (FINAL PROGRAM)

```
FILE NAME : ZMCN.CBL
000001 IDENTIFICATION DIVISION.
000002 CLASS-ID. INVENTORY-MASTER-CORRECTION-controller INHERITS CBL-BASE.   ← (2-1)
000003 ENVIRONMENT DIVISION.
000004 CONFIGURATION SECTION.
000005 REPOSITORY.
000006     CLASS CBL-BASE.
000007     CLASS INVENTORY-MASTER-CORRECTION-view  IS 'ZMVI'.                 ← (2-1)
000008     CLASS INVENTORY-MASTER-CORRECTION-model IS 'ZMMD'.
000009
000010 IDENTIFICATION DIVISION.
000011 CLASS-OBJECT.
000012 PROCEDURE DIVISION.
000013*****************************************************************************
000014* CLASS METHOD
000015*****************************************************************************
000016 IDENTIFICATION DIVISION.
000017 METHOD-ID. 'create'.
000018*****************************************************************************
000019 DATA DIVISION.
000020 LINKAGE SECTION.
000021 01  L-INVENTORY-MASTER-CORRECTION-view OBJECT REFERENCE INVENTORY-MASTER-CORRECTION-view ONLY.
000022 WORKING-STORAGE SECTION.
000023 01  W-INVENTORY-MASTER-CORRECTION-controller OBJECT REFERENCE SELF.
000024 PROCEDURE DIVISION USING L-INVENTORY-MASTER-CORRECTION-view.
000025     INVOKE SELF 'CBL-NEW'
000026           RETURNING W-INVENTORY-MASTER-CORRECTION-controller.
000027     SET O-INVENTORY-MASTER-CORRECTION-view OF W-INVENTORY-MASTER-CORRECTION- controller
000028      TO L-INVENTORY-MASTER-CORRECTION-view.
000029     INVOKE INVENTORY-MASTER-CORRECTION-model 'create'
000030           USING O-INVENTORY-MASTER-CORRECTION-view  OF W-INVENTORY-MASTER-CORRECTION-controller
000031       RETURNING O-INVENTORY-MASTER-CORRECTION-model OF W-INVENTORY-MASTER-CORRECTION-controller.
000032     INVOKE W-INVENTORY-MASTER-CORRECTION-controller 'uiMain'.
000033     EXIT METHOD.
000034 END METHOD 'create'.
000035 END CLASS-OBJECT.
000036
000037 IDENTIFICATION DIVISION.
000038 OBJECT.
000039 DATA DIVISION.
000040*****************************************************************************
000041* INSTANCE VARIABLE
000042*****************************************************************************
000043 WORKING-STORAGE SECTION.
000044 01  O-INVENTORY-MASTER-CORRECTION-controller.
000045     05  25MINUS INVENTORY-MASTER-CORRECTION-view ONLY PROPERTY.
000046     05  O-INVENTORY-MASTER-CORRECTION-model ONLY PROPERTY.
000047
000048 PROCEDURE DIVISION.
000049*****************************************************************************
000050* INSTANCE/METHOD
000051*****************************************************************************
000052 IDENTIFICATION DIVISION.                                                ← (2-4)
000053 METHOD-ID. 'uiMain'.
000054*****************************************************************************
000055 PROCEDURE DIVISION.
000056     PERFORM UNTIL (END FLAG OF O-INVENTORY-MASTER-CORRECTION-view = '1')
000057         INVOKE O-INVENTORY-MASTER-CORRECTION-view 'displayScreen'
000058         INVOKE O-INVENTORY-MASTER-CORRECTION-model 'changeModel'
000059     END-PERFORM.
000060     EXIT METHOD.
000061 END METHOD 'uiMain'.
000062 END OBJECT.
000063 END CLASS INVENTORY-MASTER-CORRECTION-controller.                        ← (2-1)
```

Fig.44

9. MODEL CLASS (FINAL PROGRAM)

```
FILE NAME : ZMMD.CBL
000001 IDENTIFICATION DIVISION.
000002 CLASS-ID. INVENTORY-MASTER-CORRECTION-model INHERITS CBL-BASE.   ]← (2-1)
000003 ENVIRONMENT DIVISION.
000004 CONFIGURATION SECTION.
000005 REPOSITORY.
000006     CLASS CBL-BASE.
000007     CLASS INVENTORY-MASTER-CORRECTION-view    IS 'ZMVI'.        ]← (2-1)
000008     CLASS INVENTORY-MASTER-CORRECTION-session IS 'ZMSS'.        ]
000009
000010 IDENTIFICATION DIVISION.
000011 CLASS-OBJECT.
000012 PROCEDURE DIVISION.
000013*****************************************************************************
000014* CLASS METHOD
000015*****************************************************************************
000016 IDENTIFICATION DIVISION.
000017 METHOD-ID. 'create'.
000018*****************************************************************************
000019 DATA DIVISION.
000020 LINKAGE SECTION.
000021 01  L-INVENTORY-MASTER-CORRECTION-view  OBJECT REFERENCE
INVENTORY-MASTER-CORRECTION-view ONLY.
000022 01  L-INVENTORY-MASTER-CORRECTION-model OBJECT REFERENCE SELF.
000023 WORKING-STORAGE SECTION.
000024 01  W-INVENTORY-MASTER-CORRECTION-model OBJECT REFERENCE SELF.
000025
000026 PROCEDURE DIVISION USING L-INVENTORY-MASTER-CORRECTION-view
000027                 RETURNING L-INVENTORY-MASTER-CORRECTION-model.
000028     INVOKE SELF 'CBL-NEW'
000029           RETURNING W-INVENTORY-MASTER-CORRECTION-model.
000030     SET O-INVENTORY-MASTER-CORRECTION-view OF W-INVENTORY-MASTER-CORRECTION-model
000031      TO L-INVENTORY-MASTER-CORRECTION-view.
000032     SET L-INVENTORY-MASTER-CORRECTION-model TO W-INVENTORY-MASTER-CORRECTION-model.
000033     EXIT METHOD.
000034 END METHOD 'create'.
000035 END CLASS-OBJECT.
000036
000037 IDENTIFICATION DIVISION.
000038 OBJECT.
000039 DATA DIVISION.
000040*****************************************************************************
000041* INSTANCE VARIABLE
000042*****************************************************************************
000043 WORKING-STORAGE SECTION.
000044 01  T1-INVENTORY-MASTER-CORRECTION- RECORD.                ]← (2-2)
000045     05  T1-PROCESSING-CATEGORY     PIC X(1).              |
000046     05  T1-PRODUCT-CODE            PIC X(6).              |
000047     05  T1-PRODUCT-NAME            PIC X(30).             |
000048     05  T1-CURRENT-INVENTORY       PIC 9(7).              |
000049     05  T1-ALLOCATED-STOCK         PIC 9(7).              |
000050     05  T1-POINT-OF-ORDERING       PIC 9(7).              |
000051     05  T1-BASE-INVENTORY          PIC 9(7).              |
000052     05  T1-SUPPLYER-CODE           PIC X(5).              ]
000053 01  O-INVENTORY-MASTER-CORRECTION-view    OBJECT REFERENCE
INVENTORY-MASTER-CORRECTION-view    ONLY.
000054 01  O-INVENTORY-MASTER-CORRECTION-session OBJECT REFERENCE
INVENTORY-MASTER-CORRECTION-session ONLY.
```

⋮

Fig.45

(9. MODEL CLASS —CONTINUED)

```
000056 PROCEDURE DIVISION.
000057*************************************************************************
000058* INSTANCE/METHOD
000059*************************************************************************
000060 IDENTIFICATION DIVISION.
000061 METHOD-ID. 'changeModel'.
000062*************************************************************************
000063 PROCEDURE DIVISION.
000064 MAIN PROCESS.                                                          ← (2-5)
000065     PERFORM INVENTORY-MASTER-INPUT.
000066     PERFORM TRANSFORMATION-CONTROL.
000067     EXIT METHOD.
000068*************************************************************
000069 TRANSFORMATION CONTROL.                                                ← (2-6)
000070     PERFORM TRANSFORMATION.
000071     PERFORM INVENTORY-MASTER-INPUT.
000072*************************************************************
000073 INVENTORY MASTER INPUT.                                                ← (2-7)
000074     INVOKE SELF 'moveFromView'.
000075*************************************************************
000076 TRANSFORMATION.                                                        ← (2-8)
000077     IF (T1-CURRENT-INVENTORY IS NUMERIC) AND
000078        (T1-ALLOCATED-STOCK   IS NUMERIC)
000079        THEN
000080            PERFORM CHECKED-INVENTORY-MASTER-CORRECTION-OUTPUT
000081     END-IF.
000082*************************************************************
000083 CHECKEDINVENTORY-MASTER-CORRECTION-OUTPUT.                             ← (2-9)
000084     INVOKE INVENTORY-MASTER-CORRECTION-session 'create'
000085            RETURNING O-INVENTORY-MASTER-CORRECTION-session.
000086     INVOKE O-INVENTORY-MASTER-CORRECTION-session 'checkTransaction'
000087            USING T1-INVENTORY-MASTER-CORRECTION-RECORD.
000088 END METHOD 'changeModel'.
000089
000090*************************************************************************
000091 IDENTIFICATION DIVISION.
000092 METHOD-ID. 'moveFromView'.
000093*************************************************************************
000094 PROCEDURE DIVISION.
000095     MOVE T1-PROCESSING-CATEGORY  OF O-INVENTORY-MASTER-CORRECTION-view TO T1-PROCESSING-CATEGORY.
000096     MOVE T1-PRODUCT-CODE         OF O-INVENTORY-MASTER-CORRECTION-view TO T1-PRODUCT-CODE.
000097     MOVE T1-PRODUCT-NAME         OF O-INVENTORY-MASTER-CORRECTION-view TO T1-PRODUCT-NAME.
000098     MOVE T1-CURRENT-INVENTORY    OF O-INVENTORY-MASTER-CORRECTION-view TO T1-CURRENT-INVENTORY.
000099     MOVE T1-ALLOCATED-STOCK      OF O-INVENTORY-MASTER-CORRECTION-view TO T1-ALLOCATED-STOCK.
000100     MOVE T1-POINT-OF-ORDERING    OF O-INVENTORY-MASTER-CORRECTION-view TO T1-POINT-OF-ORDERING.
000101     MOVE T1-BASE-INVENTORY       OF O-INVENTORY-MASTER-CORRECTION-view TO T1-BASE-INVENTORY.
000102     MOVE T1-SUPPLYER-CODE        OF O-INVENTORY-MASTER-CORRECTION-view TO T1-SUPPLYER-CODE.
000103     EXIT METHOD.
000104 END METHOD 'moveFromView'.
000105 END OBJECT.
000106 END CLASS INVENTORY-MASTER-CORRECTION-model.                           ← (2-1)
```

Fig.46

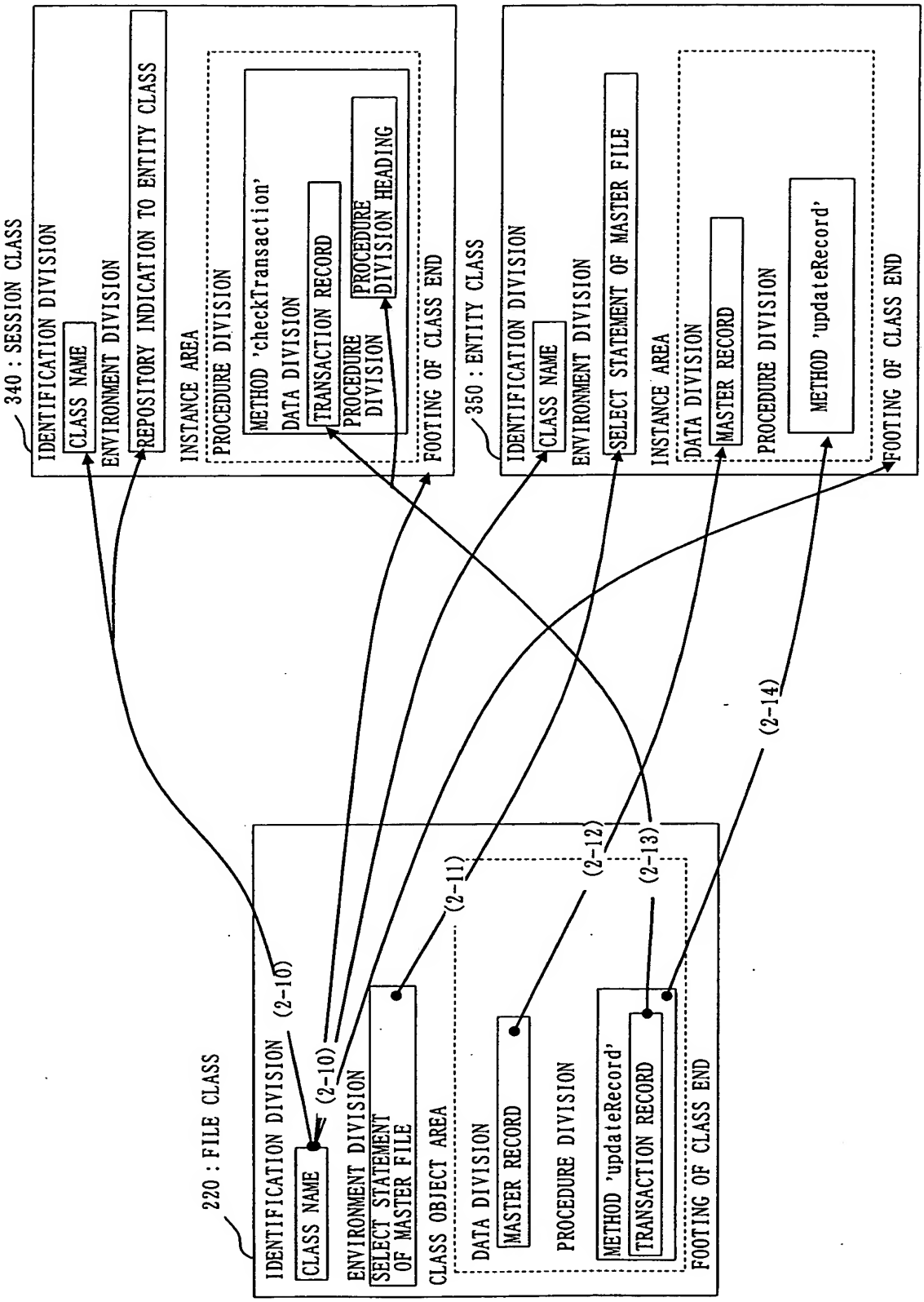

340 : SESSION CLASS
IDENTIFICATION DIVISION
CLASS NAME
ENVIRONMENT DIVISION
REPOSITORY INDICATION TO ENTITY CLASS
INSTANCE AREA
PROCEDURE DIVISION
METHOD 'checkTransaction'
DATA DIVISION
TRANSACTION RECORD
PROCEDURE DIVISION
PROCEDURE DIVISION HEADING
FOOTING OF CLASS END
350 : ENTITY CLASS
IDENTIFICATION DIVISION
CLASS NAME
ENVIRONMENT DIVISION
SELECT STATEMENT OF MASTER FILE
INSTANCE AREA
DATA DIVISION
MASTER RECORD
PROCEDURE DIVISION
METHOD 'updateRecord'
FOOTING OF CLASS END
220 : FILE CLASS
IDENTIFICATION DIVISION
CLASS NAME
ENVIRONMENT DIVISION
SELECT STATEMENT OF MASTER FILE
CLASS OBJECT AREA
DATA DIVISION
MASTER RECORD
PROCEDURE DIVISION
METHOD 'updateRecord'
TRANSACTION RECORD
FOOTING OF CLASS END
(2-10)
(2-10)
(2-11)
(2-12)
(2-13)
(2-14)

Fig.47

NUMBER	COMPONENT TO BE EXTRACTED	LOCATION AFTER TRANSFORMATION	STRUCTURAL, SYNTAX TRANSFORMATION
ORIGIN OF EXTRACTION: FILE, CLASS IDENTIFICATION DIVISION			
(2-10)	CLASS NAME	CLASS NAME	APPEND AFFIX OF SESSION CLASS
		ENVIRONMENT DIVISION INTERNAL NAME FOR REPOSITORY INDICATION FOR ENTITY CLASS	・APPEND AFFIX OF ENTITY CLASS ・FOR EXTERNAL NAME, INSERT FILE NAME OF ENTITY CLASS ACCORDING ・TO NAMING RULE
		FOOTING OF CLASS END	APPEND AFFIX OF SESSION CLASS
ORIGIN OF EXTRACTION: FILE, MATCHING AND UPDATING METHOD → AFTER TRANSFORMATION: SESSION, INSTANCE METHOD, TRANSACTION CHECKING METHOD			
(2-13)	TRANSACTION RECORD	DATA DIVISION → LINKAGE SECTION	
		PROCEDURE DIVISION HEADING	INSERT ONLY RECORD NAME

NUMBER	COMPONENT TO BE EXTRACTED	LOCATION AFTER TRANSFORMATION	STRUCTURAL, SYNTAX TRANSFORMATION	REASON FOR THIS EXTRACTION/ TRANSFORMATION
ORIGIN OF EXTRACTION: FILE, CLASS IDENTIFICATION DIVISION				
(2-10)	CLASS NAME	CLASS NAME	APPEND AFFIX OF ENTITY CLASS	
		CLASS END FOOTING	〃	
ORIGIN OF EXTRACTION: FILE, ENVIRONMENT DIVISION				
(2-11)	"SELECT" STATEMENT OF MASTER FILE	ENVIRONMENT DIVISION OF INSTANCE	NONE	
ORIGIN OF EXTRACTION: FILE, CLASS VARIABLE				
(2-12)	DEFINITION OF MASTER RECORD	INSTANCE VARIABLE		
ORIGIN OF EXTRACTION: FILE, MATCHING AND UPDATING METHOD -> AFTER TRANSFORMATION: ENTITY, INSTANCE METHOD, MATCHING AND UPDATING METHOD				
(2-14, MATCHING AND UPDATING METHOD) IS EXTRACTED AND INSERTED WITHOUT CHANGE				

Fig.48

Fig.49

10. SESSION CLASS (FINAL PROGRAM)

FILE NAME : ZMSS.CBL

```
000001 IDENTIFICATION DIVISION.
000002 CLASS-ID. INVENTORY-MASTER-CORRECTION-session INHERITS CBL-BASE.
000003 ENVIRONMENT DIVISION.
000004 CONFIGURATION SECTION.
000005 REPOSITORY.
000006     CLASS CBL-BASE.
000007     CLASS INVENTORY-MASTER-CORRECTION-entity IS 'ZMEN'.
000009 IDENTIFICATION DIVISION.
000010 CLASS-OBJECT.
000011 PROCEDURE DIVISION.
000012*****************************************************************************
000013* CLASS METHOD
000014*****************************************************************************
000015 IDENTIFICATION DIVISION.
000016 METHOD-ID. 'create'.
000017 DATA DIVISION.
000018 LINKAGE SECTION.
000019 01  L-INVENTORY-MASTER-CORRECTION-session OBJECT REFERENCE SELF.
000020 WORKING-STORAGE SECTION.
000021 01  W-INVENTORY-MASTER-CORRECTION-session OBJECT REFERENCE SELF.
000022 PROCEDURE DIVISION RETURNING L-INVENTORY-MASTER-CORRECTION-session.
000023     INVOKE SELF 'CBL-NEW'
000024           RETURNING W-INVENTORY-MASTER-CORRECTION-session.
000025     INVOKE INVENTORY-MASTER-CORRECTION-entity 'create'
000026           RETURNING O-INVENTORY-MASTER-CORRECTION-entity OF
W-INVENTORY-MASTER-CORRECTION-session.
000027     SET L-INVENTORY-MASTER-CORRECTION-session TO
W-INVENTORY-MASTER-CORRECTION-session.
000028     EXIT METHOD.
000029 END METHOD 'create'.
000030 END CLASS-OBJECT.
000031
000032 IDENTIFICATION DIVISION.
000033 OBJECT.
000034 DATA DIVISION.
000035*****************************************************************************
000036* INSTANCE VARIABLE
000037*****************************************************************************
000038 WORKING-STORAGE SECTION.
000039 01  O-INVENTORY-MASTER-CORRECTION-entity OBJECT REFERENCE
INVENTORY-MASTER-CORRECTION-entity ONLY.
000040
```

← (2-10)

← (2-10)

⋮

Fig.50

((10. SESSION CLASS --CONTINUED)

```
000041 PROCEDURE DIVISION.
000042*****************************************************************************
000043* INSTANCE/METHOD
000044*****************************************************************************
000045 IDENTIFICATION DIVISION.
000046 METHOD-ID. 'checkTransaction'.
000047 DATA DIVISION.
000048 LINKAGE SECTION.
000049 01  T1-INVENTORY-MASTER-CORRECTION-RECORD.                    ← (2-13)
000050     05  T1-PROCESSING-CATEGORY   PIC X(1).
000051         88  T1-ADD VALUE '1'.
000052         88  T1-UPDATE VALUE '2'.
000053         88  T1-DELETE VALUE '9'.
000054     05  T1-PRODUCT-CODE          PIC X(6).
000055     05  T1-PRODUCT-NAME          PIC X(30).
000056     05  T1-CURRENT-INVENTORY     PIC 9(7).
000057     05  T1-ALLOCATED-STOCK       PIC 9(7).
000058     05  T1-POINT-OF-ORDERING     PIC 9(7).
000059     05  T1-BASE-INVENTORY        PIC 9(7).
000060     05  T1-SUPPLYER-CODE         PIC X(5).
000061 WORKING-STORAGE SECTION.
000062 01  W-FILE-ERROR-FLAG            PIC X(1).
000063     88  RECORD-EXIST VALUE '1'.
000064     88  RECORD-NOT-EXIST VALUE '0'.
000065
000066 PROCEDURE DIVISION USING T1-INVENTORY-MASTER-CORRECTION-RECORD  ← (2-13)
000067     INVOKE O-INVENTORY-MASTER-CORRECTION-entity  'recordExists'
000068          RETURNING W-FILE-ERROR-FLAG.
000069     EVALUATE T1-PROCESSING-CATEGORY
000070         WHEN T1-ADD
000071              IF RECORD-NOT-EXIST
000072                 THEN
000073                     INVOKE O-INVENTORY-MASTER-CORRECTION-entity  'updateRecord'
000074                          USING T1-INVENTORY-MASTER-CORRECTION-RECORD
000075              END-IF
000076         WHEN T1-UPDATE T1-DELETE
000077              IF RECORD-EXIST
000078                 THEN
000079                     INVOKE O-INVENTORY-MASTER-CORRECTION-entity  'updateRecord'
000080                          USING T1-INVENTORY-MASTER-CORRECTION-RECORD
000081              END-IF
000082     END-EVALUATE.
000083     EXIT METHOD.
000084 END METHOD 'checkTransaction'.
000085 END OBJECT.
000086 END CLASS INVENTORY-MASTER-CORRECTION-session.  ← (2-10)
```

Fig.51

11. ENTITY CLASS (FINAL PROGRAM)

FILE NAME : ZMEN.CBL

```
000001 IDENTIFICATION DIVISION.
000002 CLASS-ID.  INVENTORY-MASTER-CORRECTION-entity INHERITS CBL-BASE.
000003 ENVIRONMENT DIVISION.
000004 CONFIGURATION SECTION.
000005 REPOSITORY.
000006     CLASS CBL-BASE.
000007
000008 IDENTIFICATION DIVISION.
000009 CLASS-OBJECT.
000010 PROCEDURE DIVISION.
000011*****************************************************************************
000012* CLASS METHOD
000013*****************************************************************************
000014 IDENTIFICATION DIVISION.
000015 METHOD-ID. 'create'.
000016 DATA DIVISION.
000017 LINKAGE SECTION.
000018 01  L-INVENTORY-MASTER-CORRECTION-entity OBJECT REFERENCE SELF.
000019 WORKING-STORAGE SECTION.
000020 01  W-INVENTORY-MASTER-CORRECTION-entity OBJECT REFERENCE SELF.
000021 PROCEDURE DIVISION RETURNING L-INVENTORY-MASTER-CORRECTION-entity.
000022     INVOKE SELF 'CBL-NEW'
000023           RETURNING W-INVENTORY-MASTER-CORRECTION-entity.
000024     SET L-INVENTORY-MASTER-CORRECTION-entity TO W-INVENTORY-MASTER-CORRECTION-entity.
000025     EXIT METHOD.
000026 END METHOD 'create'.
000027 END CLASS-OBJECT.
000028
000029 IDENTIFICATION DIVISION.
000030 OBJECT.
000031 ENVIRONMENT DIVISION.
000032 INPUT-OUTPUT SECTION.
000033 FILE-CONTROL.
000034     SELECT M1-INVENTORY-MASTER-FILE
000035           ASSIGN TO "SYS030-DA-DK-I"
000036           ORGANIZATION INDEXED
000037           ACCESS RANDOM
000038           RECORD KEY M1-PRODUCT-CODE.
000039 DATA DIVISION.
000040*****************************************************************************
000041* INSTANCE VARIABLE
000042*****************************************************************************
000043 FILE SECTION.
000044 FD  M1-INVENTORY-MASTER-FILE.
000045 01  M1-INVENTORY-MASTER-RECORD.
000046     05  M1-PRODUCT-CODE          PIC X(6).
000047     05  M1-PRODUCT-NAME          PIC X(30).
000048     05  M1-CURRENT-INVENTORY     PIC S9(7).
000049     05  M1-ALLOCATED-STOCK       PIC S9(7).
000050     05  M1-POINT-OF-ORDERING     PIC S9(7).
000051     05  M1-BASE-INVENTORY        PIC S9(7).
000052     05  M1-SUPPLYER-CODE         PIC X(5).
000053
```

← (2-10)

← (2-11)

← (2-12)

Fig.52

(11. ENTITY CLASS --CONTINUED (1))

```
000054 PROCEDURE DIVISION.
000055*****************************************************************************
000056* INSTANCE METHOD
000057*****************************************************************************
000058 IDENTIFICATION DIVISION.
000059 METHOD-ID. 'recordExists'
000060*****************************************************************************
000061 DATA DIVISION.
000062 LINKAGE SECTION.
000063 01  L-PRODUCT-CODE PIC X(6).
000064 01  L-FILE-ERROR-FLAG PIC X(1).
000065     88 RECORD-EXIST VALUE '1'.
000066     88  RECORD-NOT-EXIST VALUE '0'.
000067 PROCEDURE DIVISION USING L-PRODUCT-CODE
000068                 RETURNING L-FILE-ERROR-FLAG
000069 MAIN PROCESS.
000070     OPEN INPUT M1-INVENTORY-MASTER-FILE
000071     MOVE L-PRODUCT-CODE TO M1-PRODUCT-CODE.
000072     READ M1-INVENTORY-MASTER-FILE
000073          INVALID
000074              SET RECORD-NOT-EXIST TO TRUE
000075          NOT INVALID
000076              SET RECORD-EXIST TO TRUE
000077     END-READ.
000078     EXIT METHOD.
000079 END METHOD 'recordExists'.
000080
000081*****************************************************************************
000082 IDENTIFICATION DIVISION.                                          ← (2-14)
000083 METHOD-ID. 'updateRecord'.
000084*****************************************************************************
000085 DATA DIVISION.
000086 LINKAGE SECTION.
000087 01  T1-INVENTORY-MASTER-CORRECTION-RECORD.
000088     05  T1-PROCESSING-CATEGORY     PIC X(1).
000089         88  T1-ADD      VALUE '1'.
000090         88  T1-UPDATE   VALUE '2'.
000091         88  T1-DELETE   VALUE '9'.
000092     05  T1-PRODUCT-CODE        PIC X(6).
000093     05  T1-PRODUCT-NAME        PIC X(30).
000094     05  T1-CURRENT-INVENTORY   PIC 9(7).
000095     05  T1-ALLOCATED-STOCK     PIC 9(7).
000096     05  T1-POINT-OF-ORDERING   PIC 9(7).
000097     05  T1-BASE-INVENTORY      PIC 9(7).
000098     05  T1-SUPPLYER-CODE       PIC X(5).
000099
000100 WORKING-STORAGE SECTION.
000101 01  WORKING AREA.
000102     05  W-TRANSACTION-KEY PIC X(6) VALUE LOW-VALUE.
000103     05  W-MASTER-KEY PIC X(6).
000104 01  FLAG.
000105     05  FILE-END-FLAG1  PIC X VALUE '0'.
000106     05  FILE-END-FLAG2  PIC X VALUE '0'.
000107     05  PROCESS-END-FLAG PIC X VALUE '0'.
000108
000109 PROCEDURE DIVISION USING T1-INVENTORY-MASTER-CORRECTION-RECORD.
000110 MAIN PROCESS.
000111     OPEN I-O M1-INVENTORY-MASTER-FILE
000112     PERFORM INVENTORY-MASTER-CORRECTION-INPUT.
000113     PERFORM OLD-INVENTORY-MASTER-INPUT.
000114     PERFORM UPDATE-CONTROL.
000115     CLOSE M1-INVENTORY-MASTER-FILE
000116     EXIT METHOD.
000117*****************************************************************************
000118 UPDATE CONTROL.
000119     IF (W-TRANSACTION-KEY = W-MASTER-KEY)
000120         THEN
000121             PERFORM MATCHING
000122         ELSE
000123             PERFORM TRANSACTION-PROCESS
```

⋮

Fig.53

(11. ENTITY CLASS --CONTINUED (2))

```
000125*****************************************************************
000126 MATCHING.
000127     IF (W-TRANSACTION-KEY = HIGH-VALUE)
000128         THEN
000129             MOVE '1' TO PROCESS-END-FLAG
000130         ELSE
000131             EVALUATE T1-PROCESSING-CATEGORY
000132                 WHEN T1-UPDATE
000133                     PERFORM UPDATE
000134                     PERFORM NEW-NVENTORY-MASTER-OUTPUT
000135                 WHEN T1-DELETE
000136                     PERFORM DELETE-PROCESS
000137             END-EVALUATE
000138     END-IF.
000139*****************************************************************
000140 TRANSACTION.
000141     IF T1-ADD
000142        THEN
000143            PERFORM ADD
000144            PERFORM ADD NEW-NVENTORY-MASTER-OUTPUT.
000145     END-IF.
000146*****************************************************************
000147 UPDATE.
000148     MOVE T1-PRODUCT-NAME          TO M1-PRODUCT-NAME.
000149     MOVE T1-CURRENT-INVENTORY     TO M1-CURRENT-INVENTORY.
000150     MOVE T1-ALLOCATED-STOCK       TO M1-ALLOCATED-STOCK.
000151     MOVE T1-POINT-OF-ORDERING     TO M1-POINT-OF-ORDERING.
000152     MOVE T1-BASE-INVENTORY        TO M1-BASE-INVENTORY.
000153     MOVE T1-SUPPLYER-CODE         TO M1-SUPPLYER-CODE.
000154*****************************************************************
000155 ADD.
000156     MOVE T1-PRODUCT-CODE          TO M1-PRODUCT-CODE.
000157     MOVE T1-PRODUCT-NAME          TO M1-PRODUCT-NAME.
000158     MOVE T1-CURRENT-INVENTORY     TO M1-CURRENT-INVENTORY.
000159     MOVE T1-ALLOCATED-STOCK       TO M1-ALLOCATED-STOCK.
000160     MOVE T1-POINT-OF-ORDERING     TO M1-POINT-OF-ORDERING.
000161     MOVE T1-BASE-INVENTORY        TO M1-BASE-INVENTORY.
000162     MOVE T1-SUPPLYER-CODE         TO M1-SUPPLYER-CODE.
000163*****************************************************************
000164 ADD-NEW-NVENTORY-MASTER-OUTPUT.
000165     WRITE M1-INVENTORY-MASTER-RECORD
000166         INVALID MOVE '1' TO PROCESS-END-FLAG.
000167*****************************************************************
000168 NEW-NVENTORY-MASTER-OUTPUT.
000169     REWRITE M1-INVENTORY-MASTER-RECORD
000170         INVALID MOVE '1' TO PROCESS-END-FLAG.
000171*****************************************************************
000172 DELETE.
000173     DELETE M1-INVENTORY-MASTER-RECORD
000174         INVALID MOVE '1' TO PROCESS-END-FLAG.
000175*****************************************************************
000176 INVENTORY-MASTER-CORRECTION-INPUT.
000177     MOVE T1-PRODUCT-CODE
000178       TO W-TRANSACTION-KEY M1-PRODUCT-CODE
000179*****************************************************************
000180 OLD-INVENTORY-MASTER-INPUT.
000181     READ M1-INVENTORY-MASTER-FILE
000182          INVALID MOVE '1' TO FILE-END-FLAG2.
000183     IF (FILE-END-FLAG2 = '1')
000184         THEN
000185             MOVE HIGH-VALUE TO W-MASTER-KEY
000186         ELSE
000187             MOVE M1-PRODUCT-CODE TO W-MASTER-KEY
000188     END-IF.
000189 END METHOD 'updateRecord'.
000190 END OBJECT.
000191 END CLASS INVENTORY-MASTER-CORRECTION-entity.
```

← (2-14 CONTINUED)

← (2-10)

Fig.54

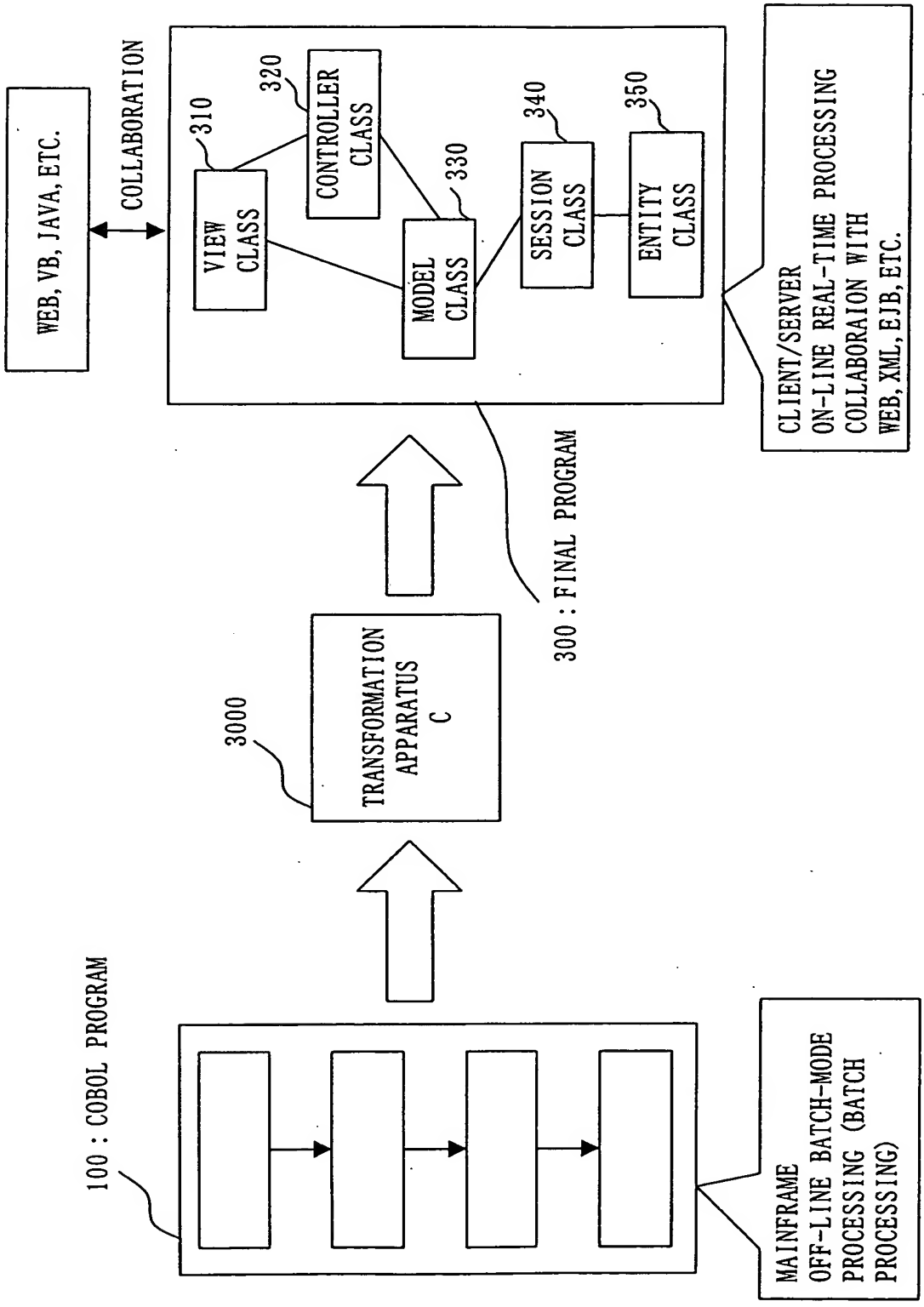

100 : COBOL PROGRAM
MAINFRAME
OFF-LINE BATCH-MODE
PROCESSING (BATCH
PROCESSING)
3000
TRANSFORMATION
APPARATUS
C
300 : FINAL PROGRAM
WEB, VB, JAVA, ETC.
COLLABORATION
310
VIEW
CLASS
320
CONTROLLER
CLASS
330
MODEL
CLASS
340
SESSION
CLASS
350
ENTITY
CLASS
CLIENT/SERVER
ON-LINE REAL-TIME PROCESSING
COLLABORAION WITH
WEB, XML, EJB, ETC.

Fig.55

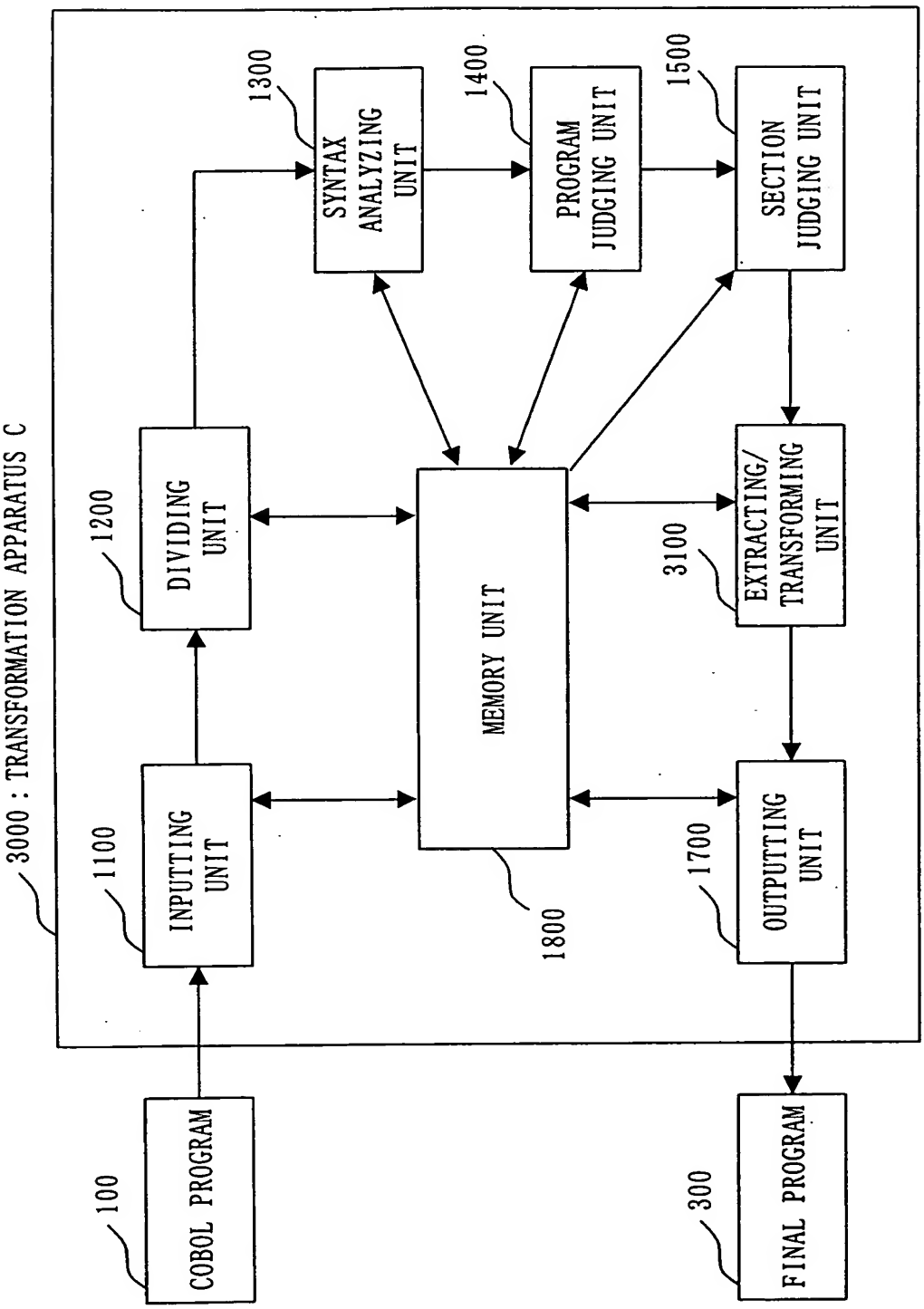

3000 : TRANSFORMATION APPARATUS C
100
COBOL PROGRAM
1100
INPUTTING UNIT
1200
DIVIDING UNIT
1300
SYNTAX ANALYZING UNIT
1400
PROGRAM JUDGING UNIT
1500
SECTION JUDGING UNIT
1800
MEMORY UNIT
3100
EXTRACTING/ TRANSFORMING UNIT
1700
OUTPUTTING UNIT
300
FINAL PROGRAM

Fig.56

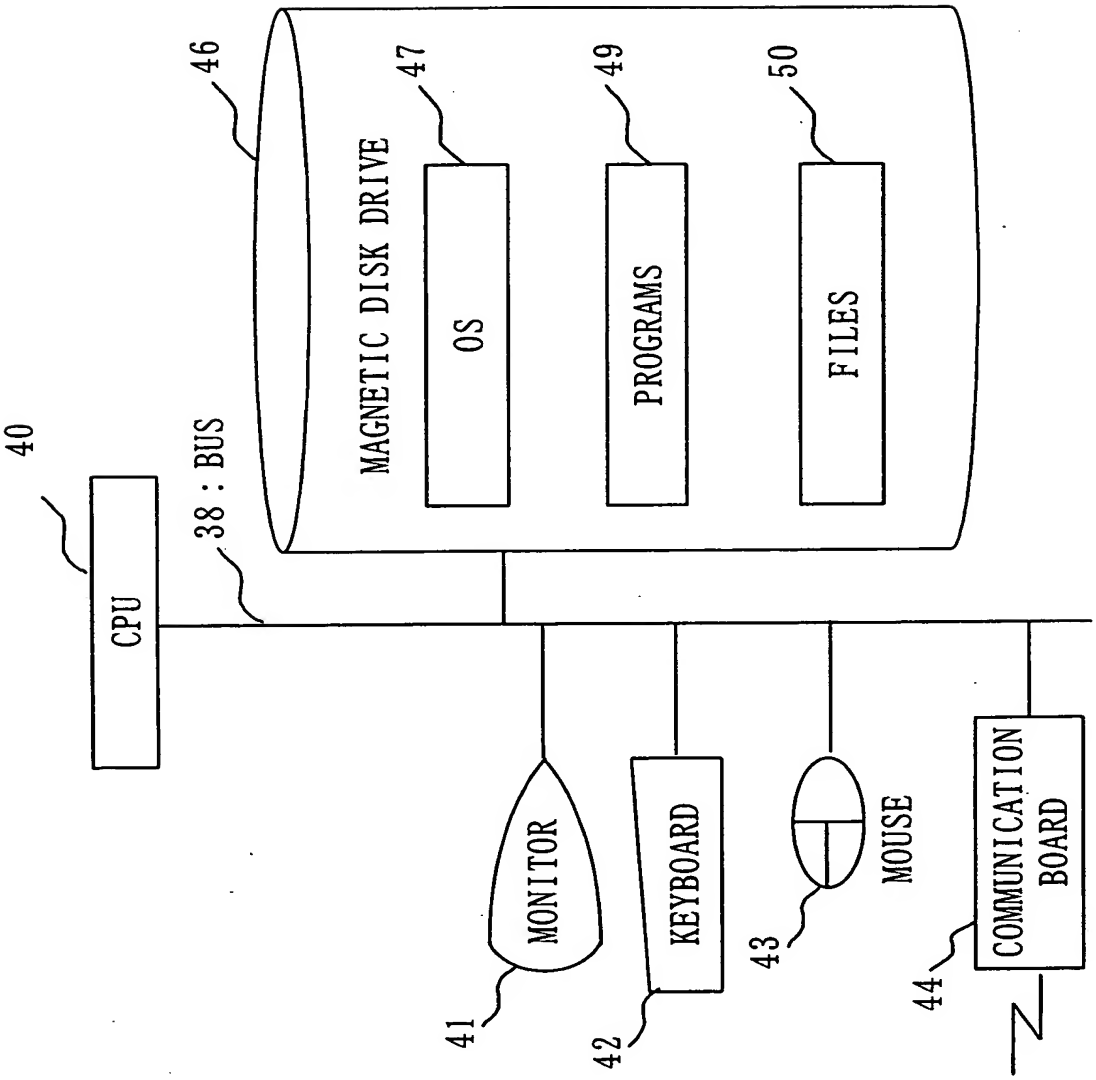

46
47
49
50
MAGNETIC DISK DRIVE
OS
PROGRAMS
FILES
40
38 : BUS
CPU
MONITOR
KEYBOARD
MOUSE
COMMUNICATION BOARD
41
42
43
44

Fig. 57

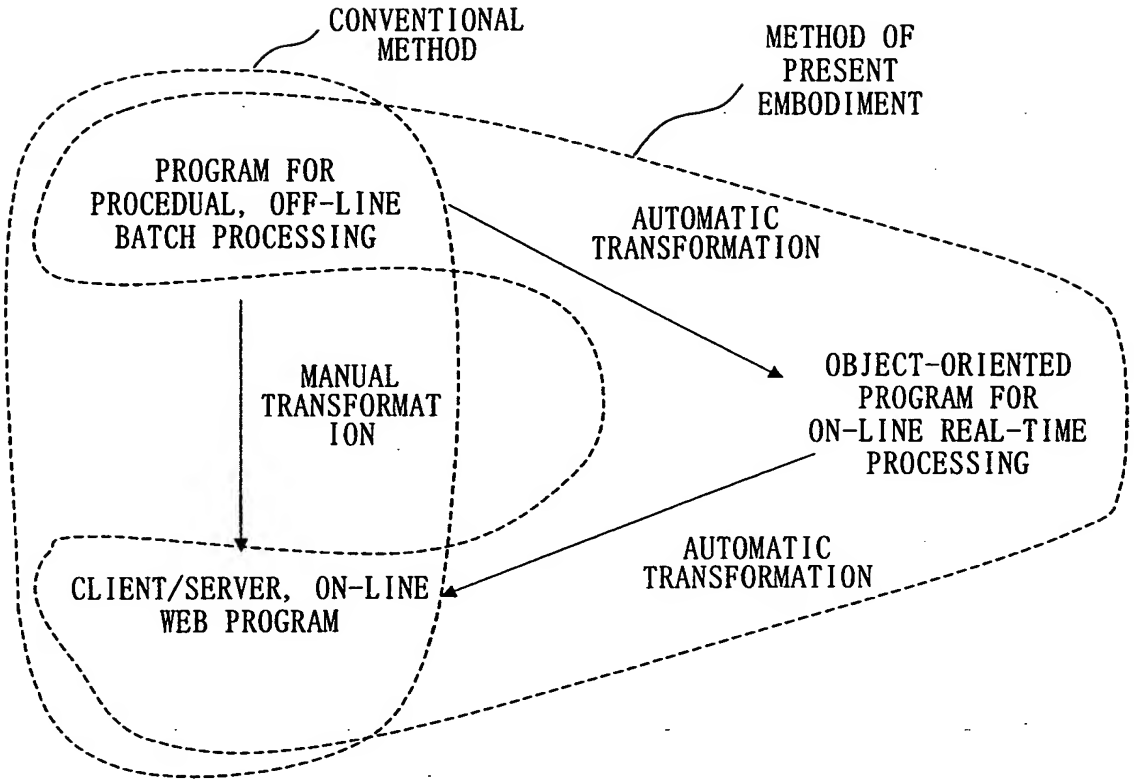

CONVENTIONAL METHOD
METHOD OF PRESENT EMBODIMENT
PROGRAM FOR PROCEDUAL, OFF-LINE BATCH PROCESSING
AUTOMATIC TRANSFORMATION
MANUAL TRANSFORMAT ION
OBJECT-ORIENTED PROGRAM FOR ON-LINE REAL-TIME PROCESSING
AUTOMATIC TRANSFORMATION
CLIENT/SERVER, ON-LINE WEB PROGRAM

Fig. 58

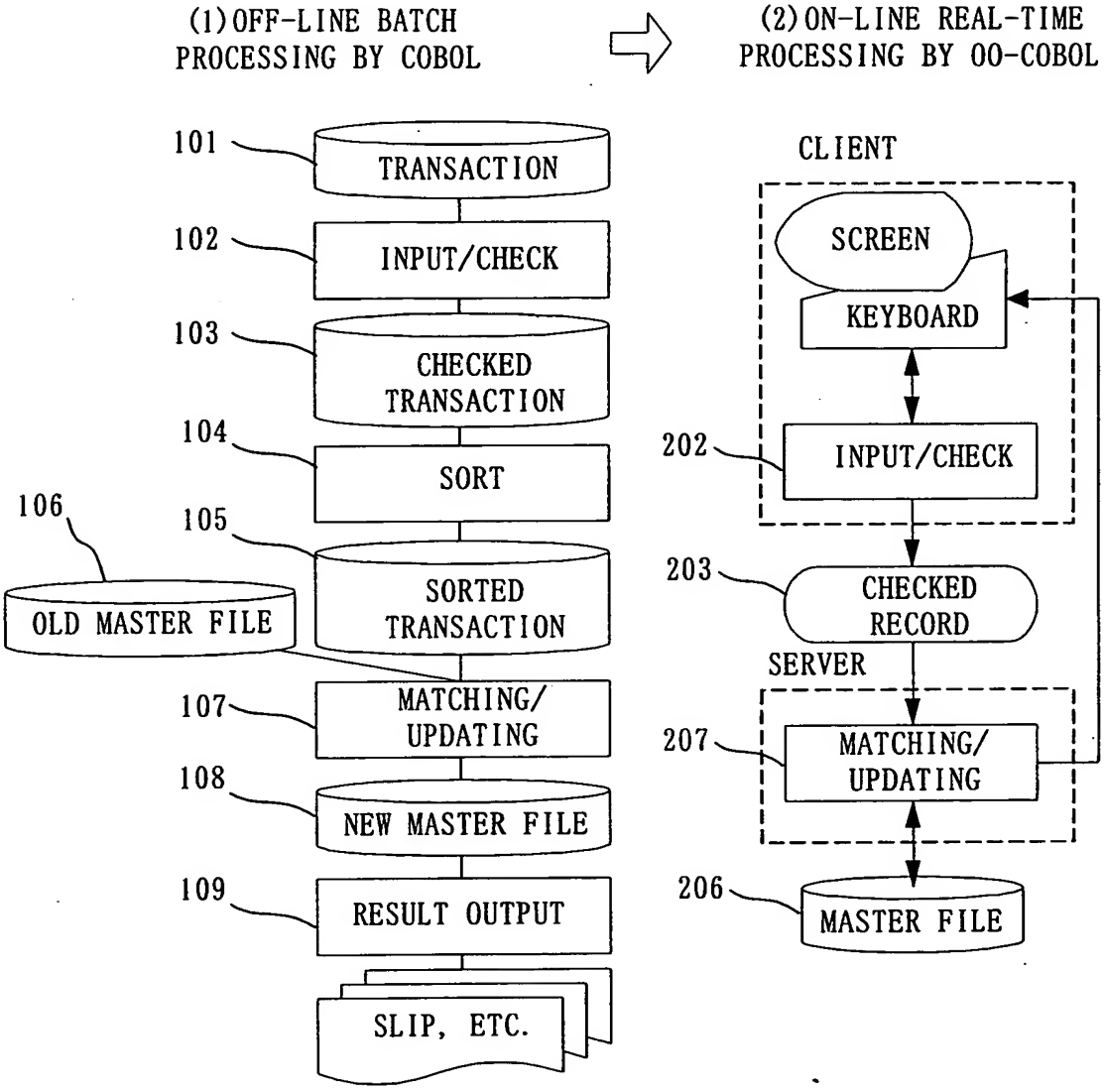

(1) OFF-LINE BATCH PROCESSING BY COBOL
(2) ON-LINE REAL-TIME PROCESSING BY OO-COBOL
101
TRANSACTION
102
INPUT/CHECK
103
CHECKED TRANSACTION
104
SORT
106
105
OLD MASTER FILE
SORTED TRANSACTION
107
MATCHING/ UPDATING
108
NEW MASTER FILE
109
RESULT OUTPUT
SLIP, ETC.
CLIENT
SCREEN
KEYBOARD
202
INPUT/CHECK
203
CHECKED RECORD
SERVER
207
MATCHING/ UPDATING
206
MASTER FILE

Fig. 59

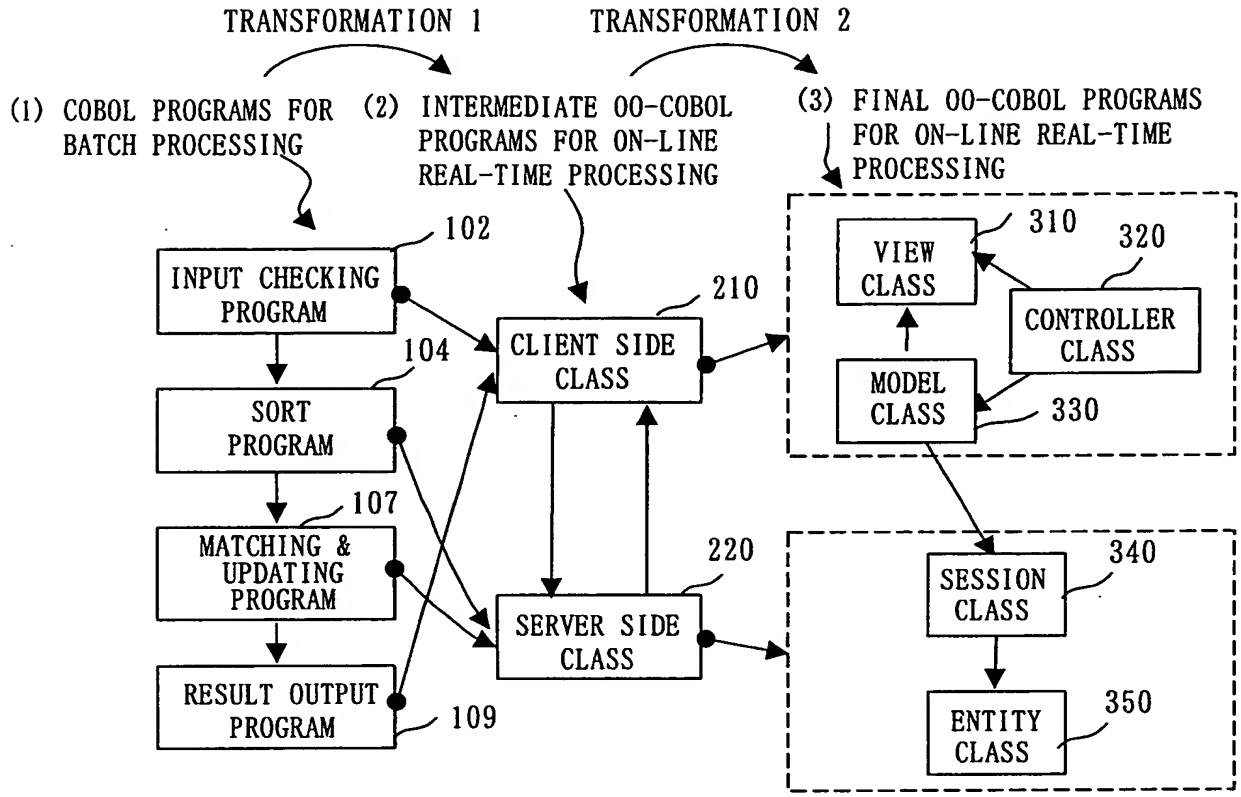

TRANSFORMATION 1
TRANSFORMATION 2
(1) COBOL PROGRAMS FOR BATCH PROCESSING
(2) INTERMEDIATE OO-COBOL PROGRAMS FOR ON-LINE REAL-TIME PROCESSING
(3) FINAL OO-COBOL PROGRAMS FOR ON-LINE REAL-TIME PROCESSING
INPUT CHECKING PROGRAM
102
SORT PROGRAM
104
MATCHING & UPDATING PROGRAM
107
RESULT OUTPUT PROGRAM
109
CLIENT SIDE CLASS
210
SERVER SIDE CLASS
220
VIEW CLASS
310
CONTROLLER CLASS
320
MODEL CLASS
330
SESSION CLASS
340
ENTITY CLASS
350

Fig. 60

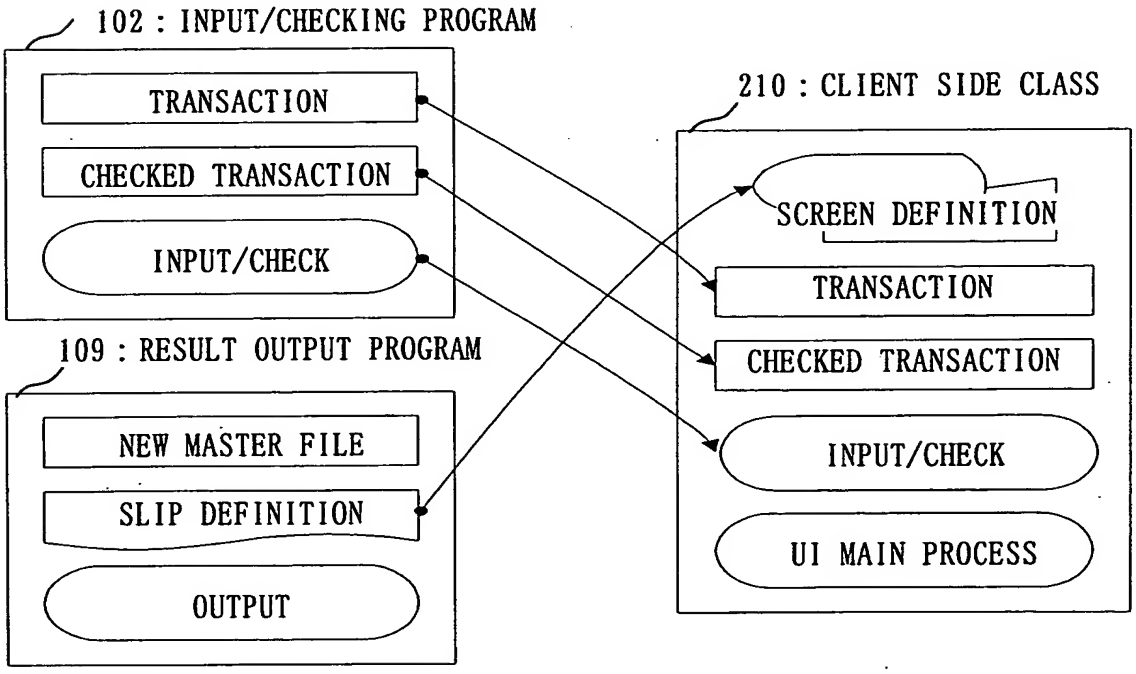

102 : INPUT/CHECKING PROGRAM
TRANSACTION
CHECKED TRANSACTION
INPUT/CHECK
109 : RESULT OUTPUT PROGRAM
NEW MASTER FILE
SLIP DEFINITION
OUTPUT
210 : CLIENT SIDE CLASS
SCREEN DEFINITION
TRANSACTION
CHECKED TRANSACTION
INPUT/CHECK
UI MAIN PROCESS

Fig. 61

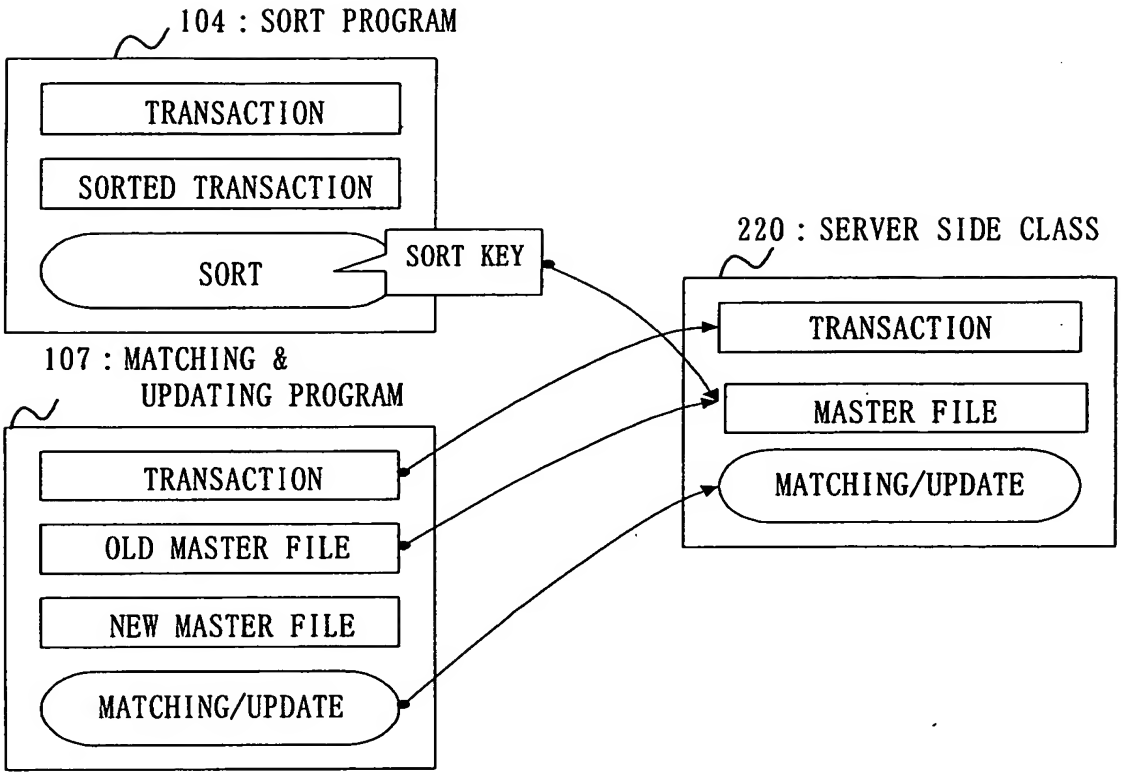

104 : SORT PROGRAM
TRANSACTION
SORTED TRANSACTION
SORT
SORT KEY
220 : SERVER SIDE CLASS
TRANSACTION
MASTER FILE
MATCHING/UPDATE
107 : MATCHING &
UPDATING PROGRAM
TRANSACTION
OLD MASTER FILE
NEW MASTER FILE
MATCHING/UPDATE

Fig. 62

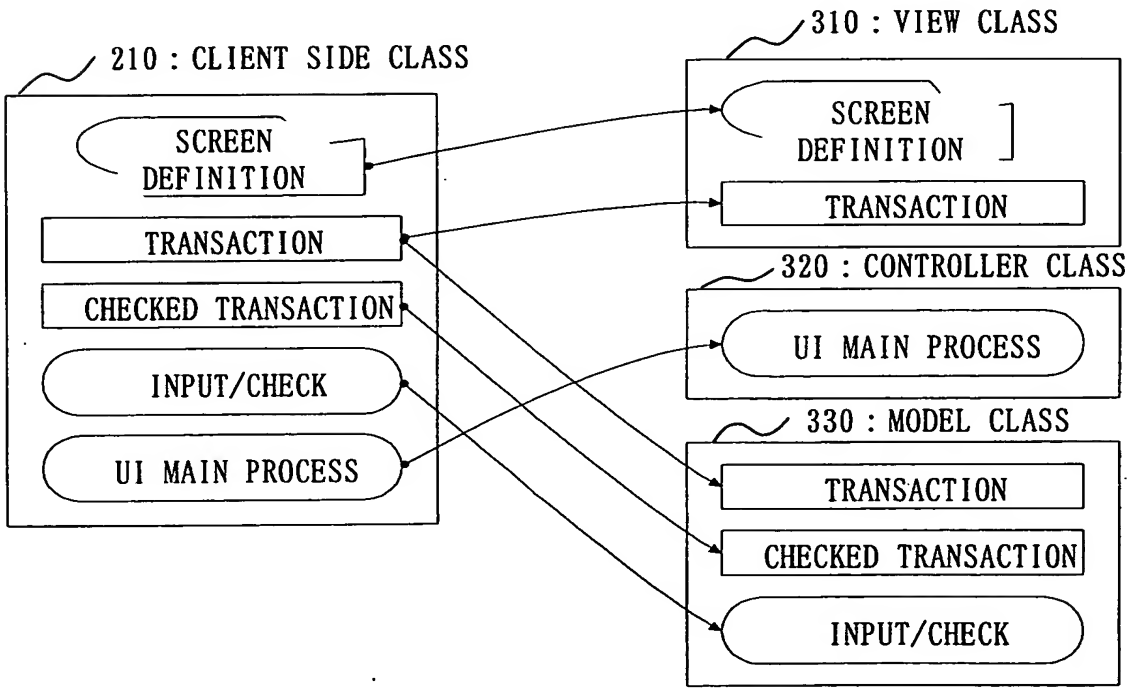

210 : CLIENT SIDE CLASS
SCREEN
DEFINITION
TRANSACTION
CHECKED TRANSACTION
INPUT/CHECK
UI MAIN PROCESS
310 : VIEW CLASS
SCREEN
DEFINITION
TRANSACTION
320 : CONTROLLER CLASS
UI MAIN PROCESS
330 : MODEL CLASS
TRANSACTION
CHECKED TRANSACTION
INPUT/CHECK

Fig. 63

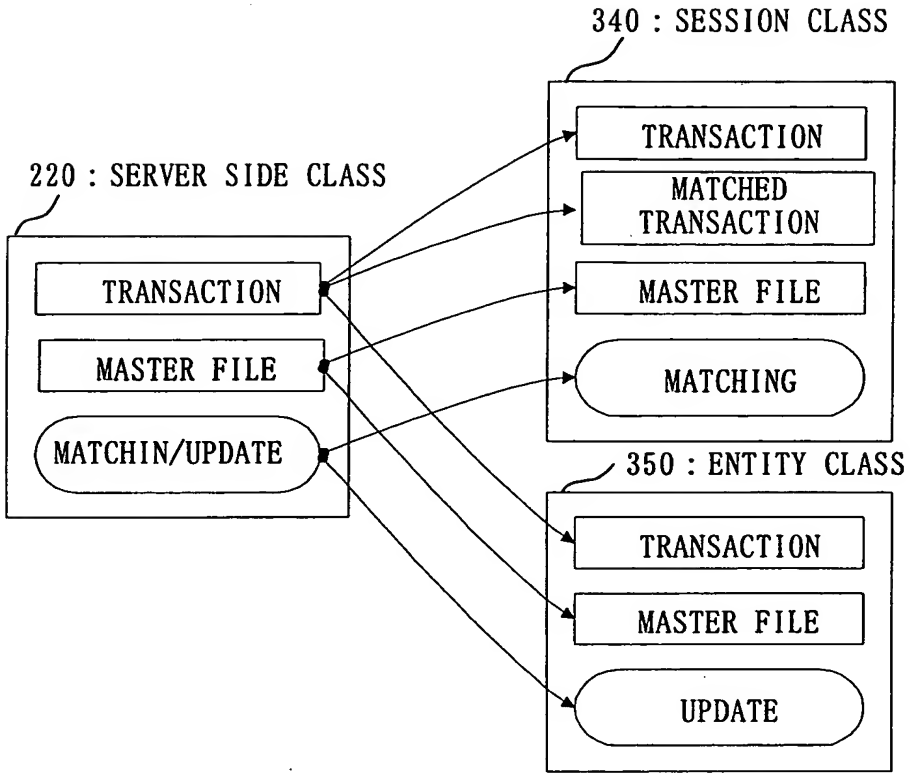

340 : SESSION CLASS
TRANSACTION
MATCHED TRANSACTION
MASTER FILE
MATCHING
220 : SERVER SIDE CLASS
TRANSACTION
MASTER FILE
MATCHIN/UPDATE
350 : ENTITY CLASS
TRANSACTION
MASTER FILE
UPDATE

Fig. 64

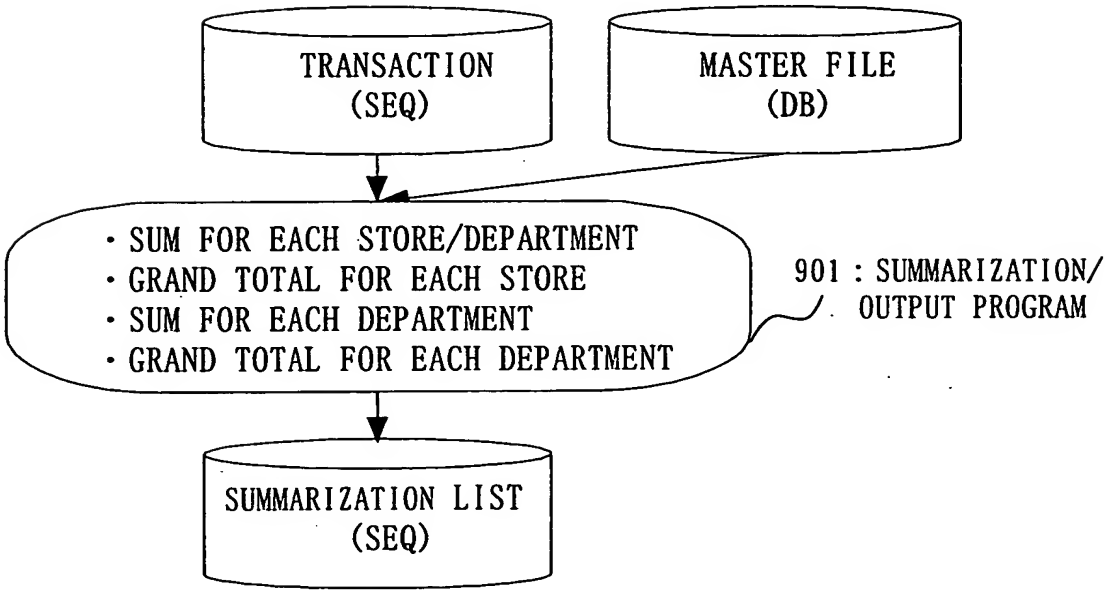
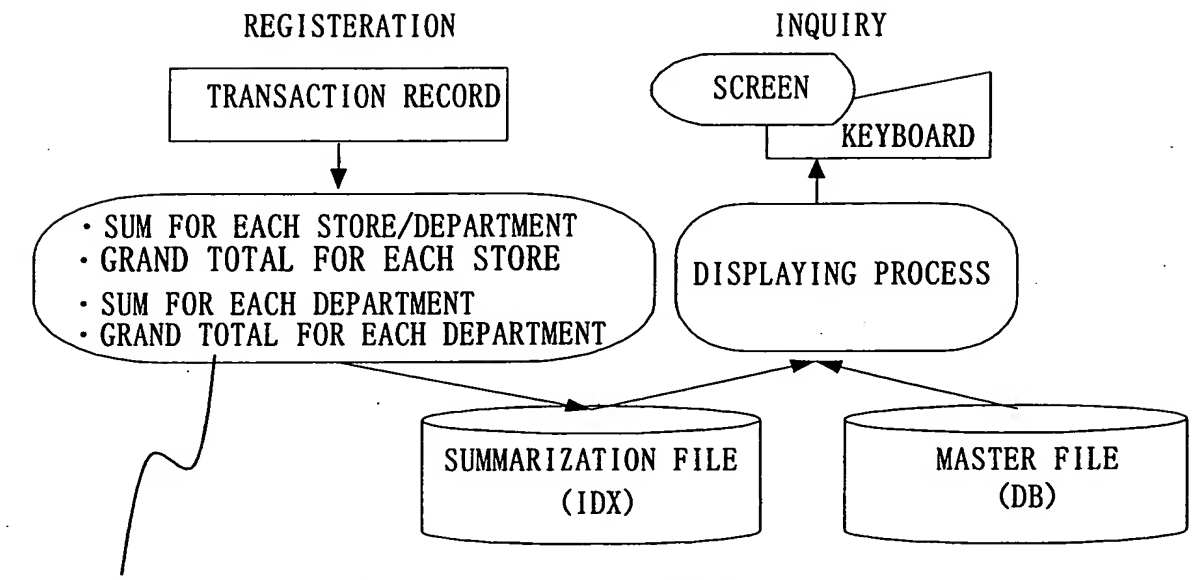

TRANSACTION (SEQ)
MASTER FILE (DB)
・SUM FOR EACH STORE/DEPARTMENT
・GRAND TOTAL FOR EACH STORE
・SUM FOR EACH DEPARTMENT
・GRAND TOTAL FOR EACH DEPARTMENT
901 : SUMMARIZATION/ OUTPUT PROGRAM
SUMMARIZATION LIST (SEQ)

Fig. 65



901a : TRANSFORMED SUMMARIZATION/OUTPUT PROGRAM

Fig. 66

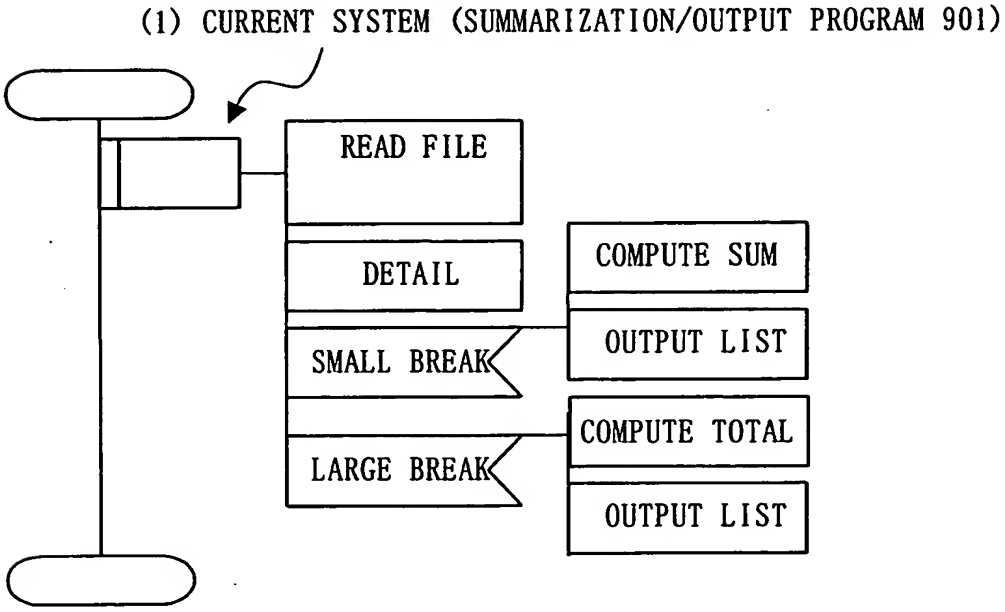


Fig. 67

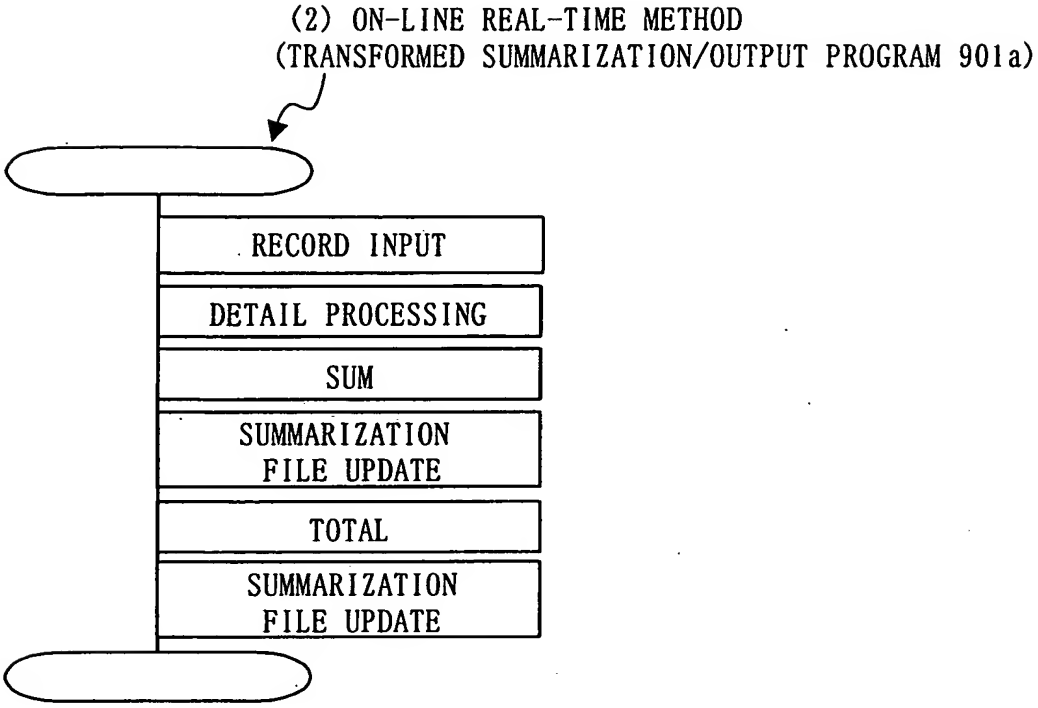

(2) ON-LINE REAL-TIME METHOD
(TRANSFORMED SUMMARIZATION/OUTPUT PROGRAM 901a)
RECORD INPUT
DETAIL PROCESSING
SUM
SUMMARIZATION FILE UPDATE
TOTAL
SUMMARIZATION FILE UPDATE

Fig. 68

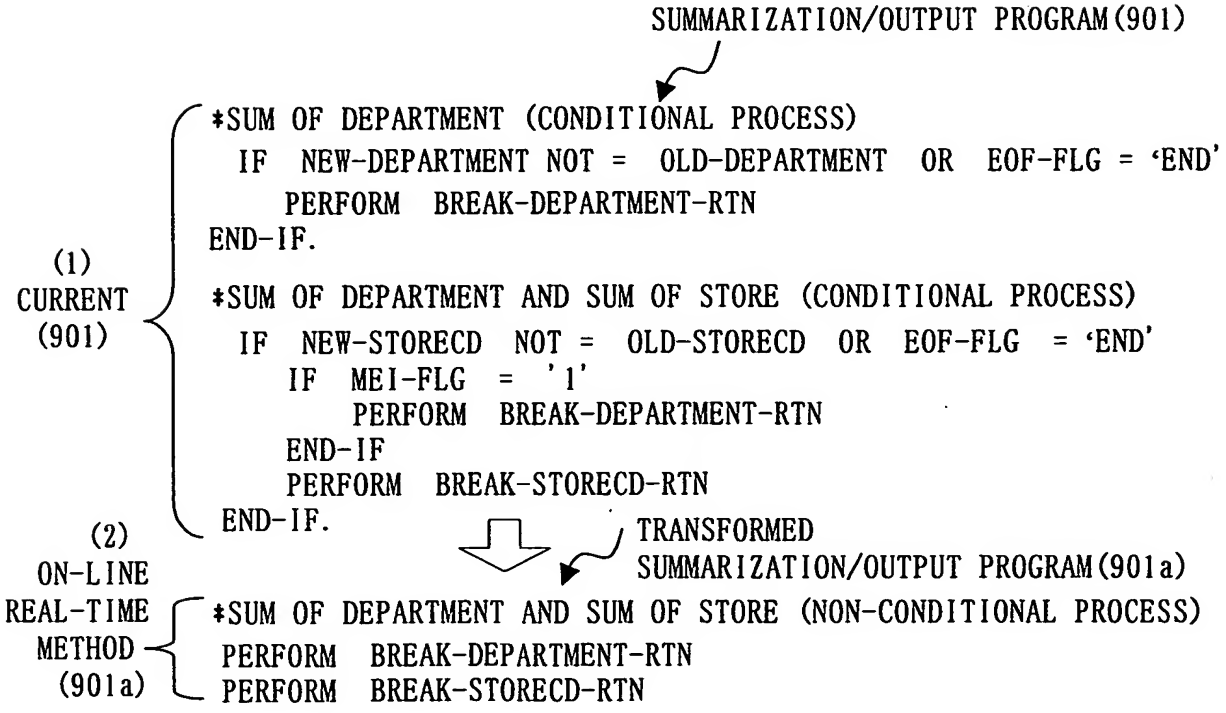

SUMMARIZATION/OUTPUT PROGRAM(901)
(1) CURRENT (901)
*SUM OF DEPARTMENT (CONDITIONAL PROCESS)
IF NEW-DEPARTMENT NOT = OLD-DEPARTMENT OR EOF-FLG = 'END'
PERFORM BREAK-DEPARTMENT-RTN
END-IF.
*SUM OF DEPARTMENT AND SUM OF STORE (CONDITIONAL PROCESS)
IF NEW-STORECD NOT = OLD-STORECD OR EOF-FLG = 'END'
IF MEI-FLG = '1'
PERFORM BREAK-DEPARTMENT-RTN
END-IF
PERFORM BREAK-STORECD-RTN
END-IF.
TRANSFORMED SUMMARIZATION/OUTPUT PROGRAM(901a)
(2) ON-LINE REAL-TIME METHOD (901a)
*SUM OF DEPARTMENT AND SUM OF STORE (NON-CONDITIONAL PROCESS)
PERFORM BREAK-DEPARTMENT-RTN
PERFORM BREAK-STORECD-RTN

Fig. 69

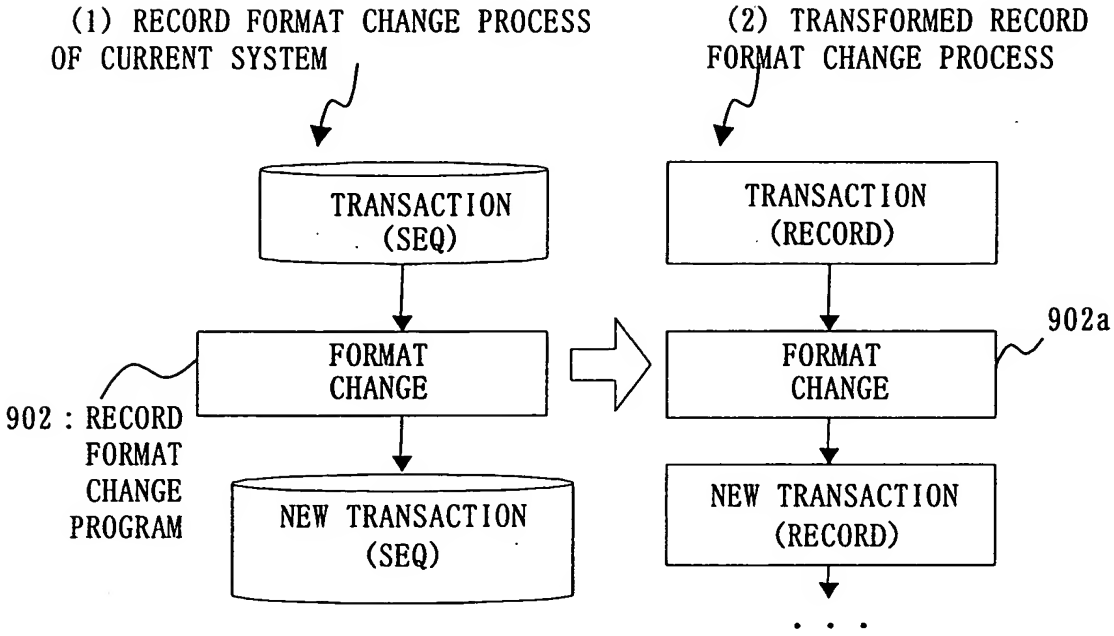

(1) RECORD FORMAT CHANGE PROCESS OF CURRENT SYSTEM
(2) TRANSFORMED RECORD FORMAT CHANGE PROCESS
TRANSACTION (SEQ)
TRANSACTION (RECORD)
FORMAT CHANGE
FORMAT CHANGE
902a
902 : RECORD FORMAT CHANGE PROGRAM
NEW TRANSACTION (SEQ)
NEW TRANSACTION (RECORD)

Fig. 70

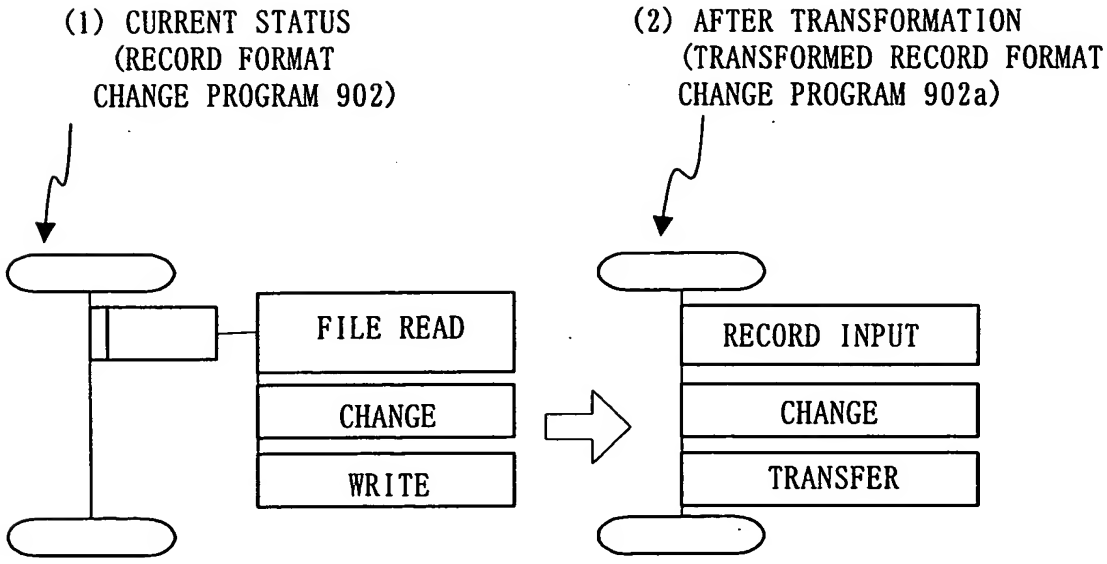

(1) CURRENT STATUS (RECORD FORMAT CHANGE PROGRAM 902)
(2) AFTER TRANSFORMATION (TRANSFORMED RECORD FORMAT CHANGE PROGRAM 902a)
FILE READ
CHANGE
WRITE
RECORD INPUT
CHANGE
TRANSFER

Fig. 71

(1) CURRENT STATUS (902)

```
*LOOP PROCESSING UNTIL END OF FILE
  PERFORM INIT-RTN.
  PERFORM F1-READ-RTN.
  PERFORM MAIN-RTN    UNTIL    EOF-FLG    =    'END'.
  PERFORM TERM-RTN.
```

(2) AFTER TRANSFORMATION (902a)

```
*WITHOUT LOOP PROCESSING
  PERFORM INIT-RTN.
  PERFORM MAIN-RTN
  PERFORM TERM-RTN.
```

Fig. 72

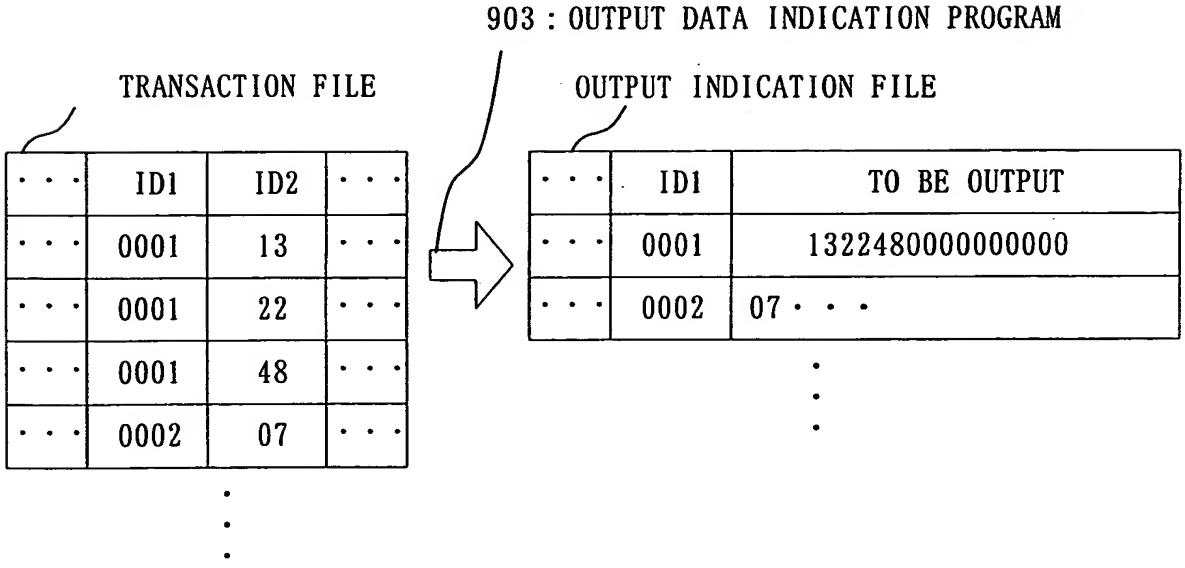


Fig. 73

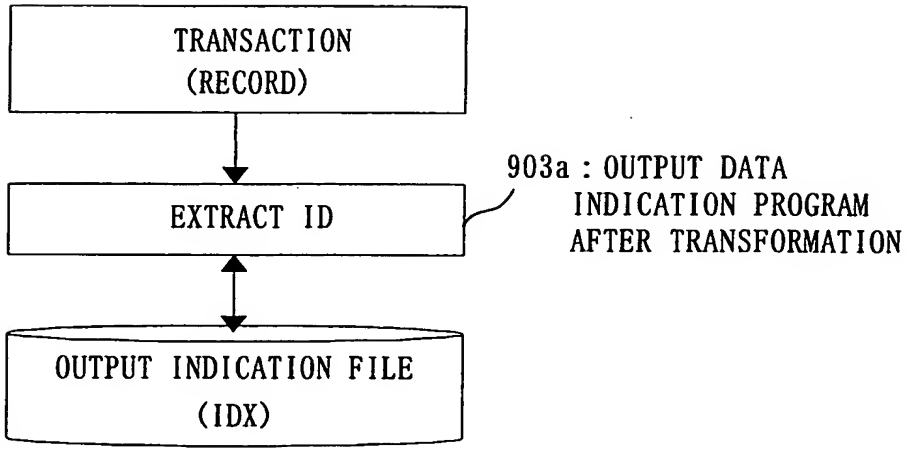

TRANSACTION
(RECORD)
EXTRACT ID
903a : OUTPUT DATA
INDICATION PROGRAM
AFTER TRANSFORMATION
OUTPUT INDICATION FILE
(IDX)

Fig. 74

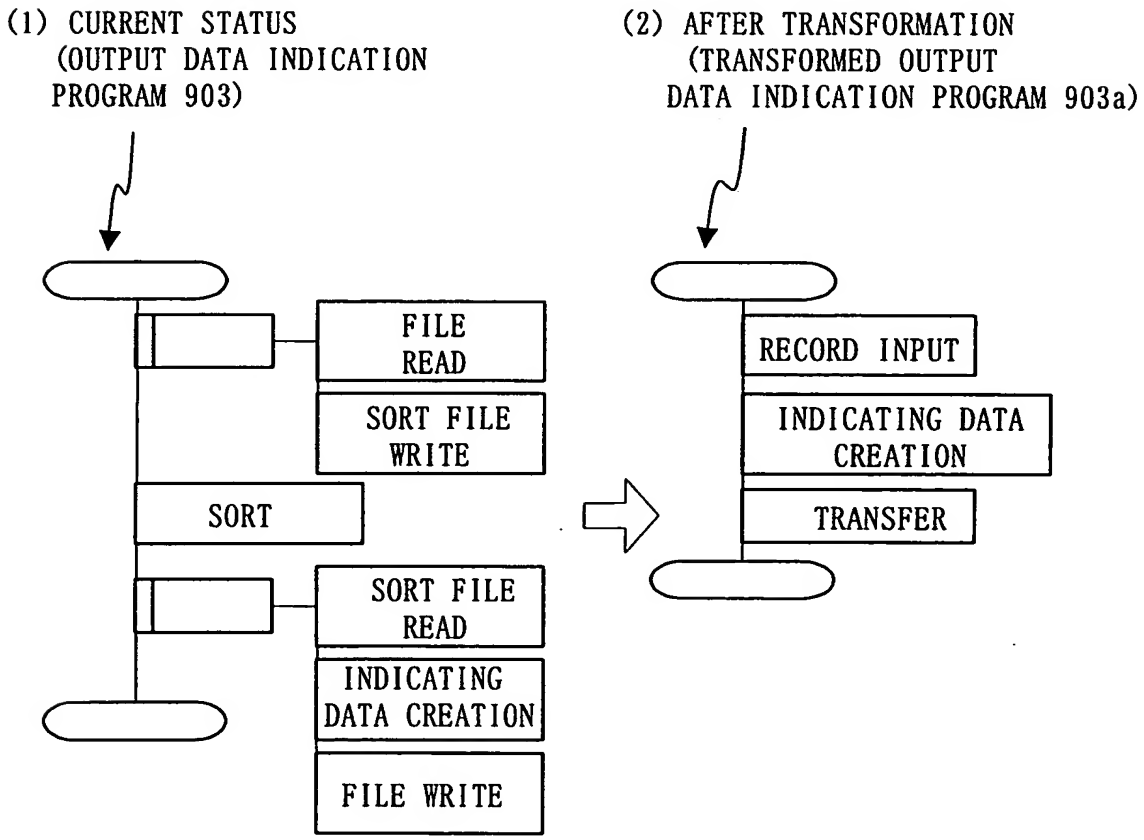

(1) CURRENT STATUS
(OUTPUT DATA INDICATION
PROGRAM 903)
FILE
READ
SORT FILE
WRITE
SORT
SORT FILE
READ
INDICATING
DATA CREATION
FILE WRITE
(2) AFTER TRANSFORMATION
(TRANSFORMED OUTPUT
DATA INDICATION PROGRAM 903a)
RECORD INPUT
INDICATING DATA
CREATION
TRANSFER

Fig. 75

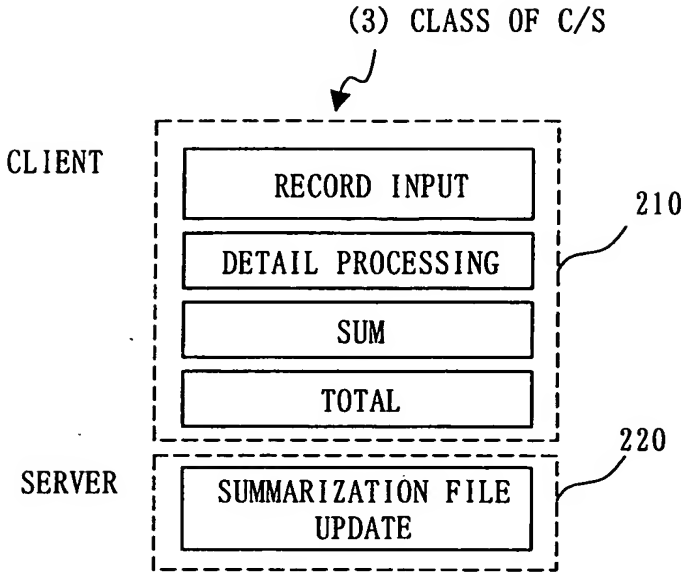

(3) CLASS OF C/S
CLIENT
RECORD INPUT
DETAIL PROCESSING
SUM
TOTAL
210
SERVER
SUMMARIZATION FILE UPDATE
220

Fig. 76

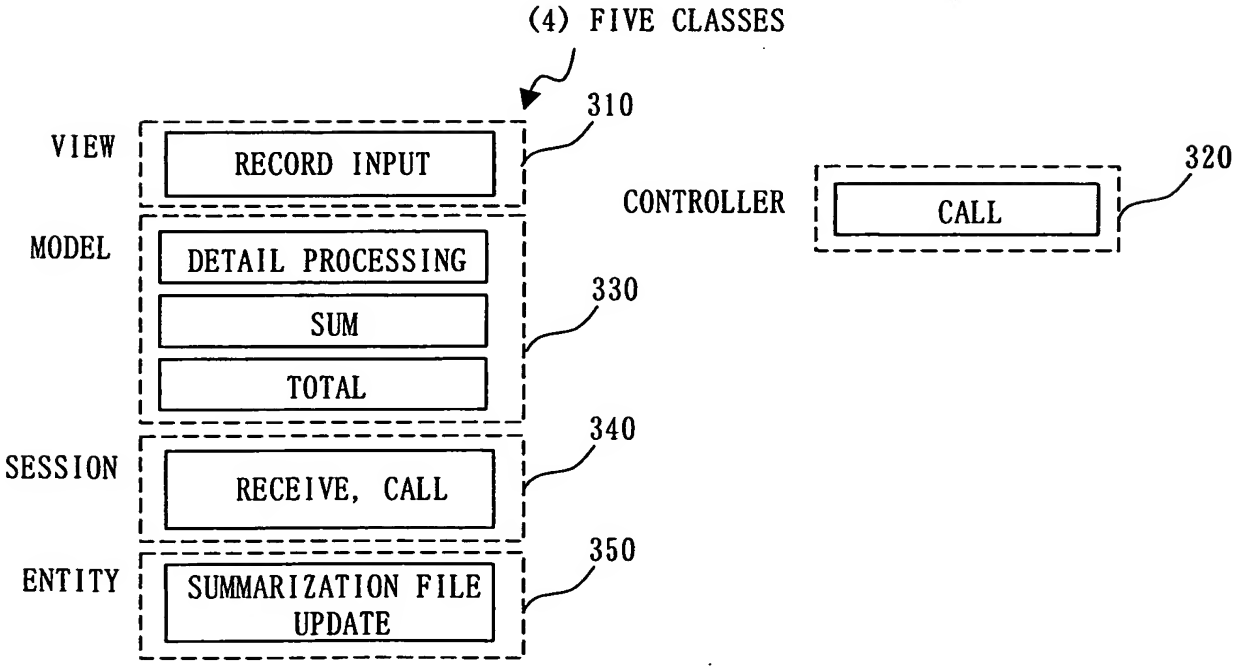

(4) FIVE CLASSES
VIEW
RECORD INPUT
310
CONTROLLER
CALL
320
MODEL
DETAIL PROCESSING
SUM
TOTAL
330
SESSION
RECEIVE, CALL
340
ENTITY
SUMMARIZATION FILE UPDATE
350

Fig. 77

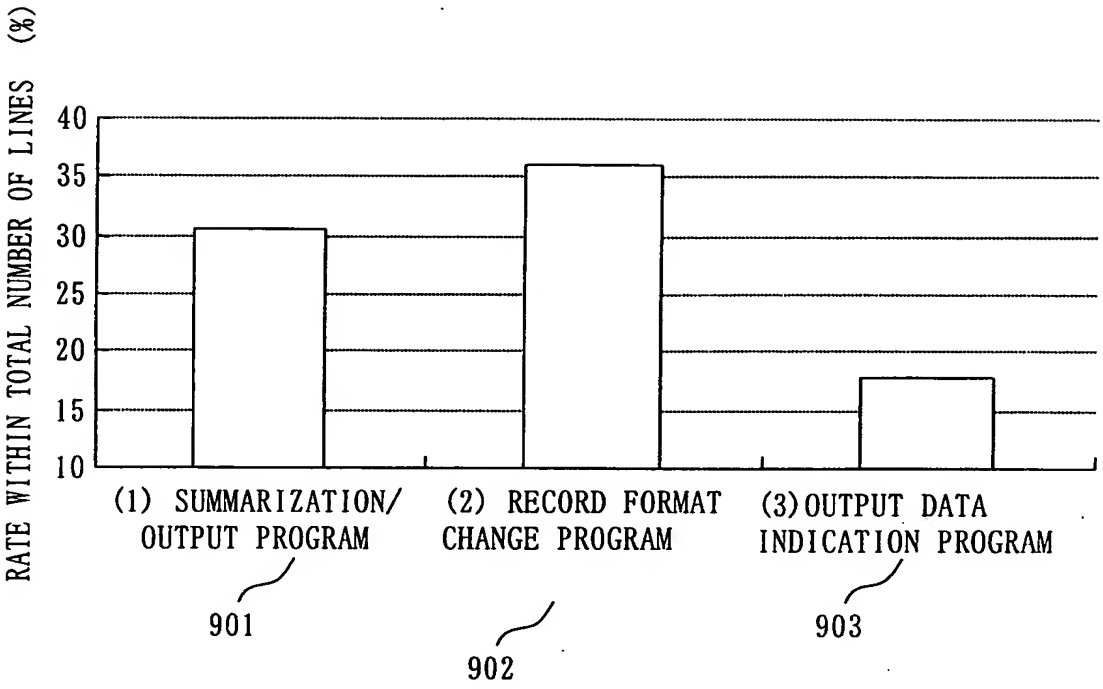
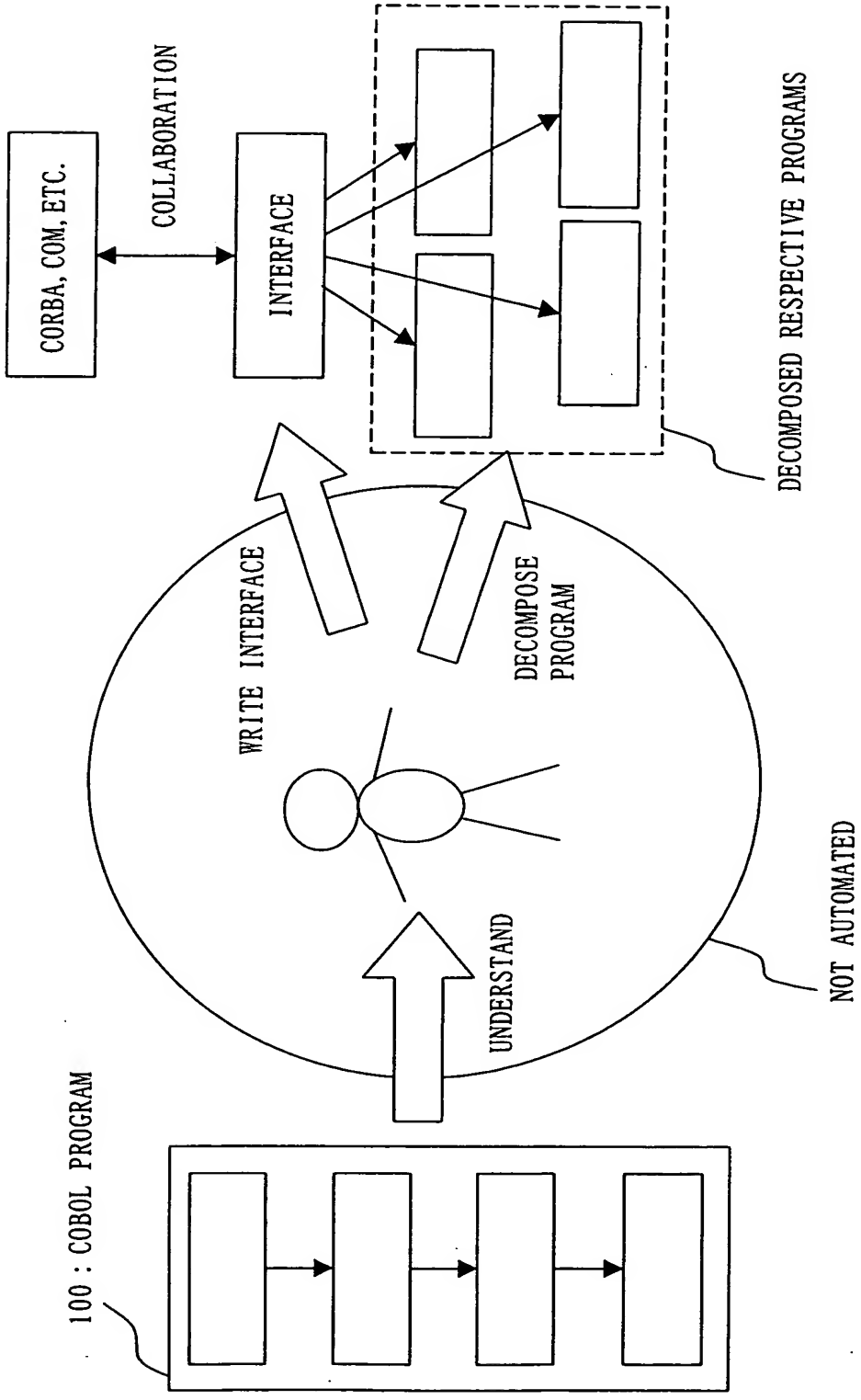

RATE WITHIN TOTAL NUMBER OF LINES (%)
40
35
30
25
20
15
10
(1) SUMMARIZATION/ OUTPUT PROGRAM
(2) RECORD FORMAT CHANGE PROGRAM
(3) OUTPUT DATA INDICATION PROGRAM
901
902
903

Fig.78


CORBA, COM, ETC.
COLLABORATION
INTERFACE
DECOMPOSED RESPECTIVE PROGRAMS
WRITE INTERFACE
DECOMPOSE PROGRAM
UNDERSTAND
NOT AUTOMATED
100 : COBOL PROGRAM